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ON

THE TYPHOID BACILLUS AND TYPHOID FEVER.

Delivered before the Royal College of Physicians of London

By P. HORTON-SMITH, M.A., M.D. CANTAB., F.R.C.P. LOND.,

ASSISTANT PHYSICIAN TO THE BROMPTON HOSPITAL FOR CONSUMPTION AND TO THE METROPOLITAN HOSPITAL; ASSISTANT MEDICAL TUTOR TO ST. BARTHOLOMEW'S HOSPITAL.

LECTURE I.[1]

Delivered on March 20th.

MR. PRESIDENT AND GENTLEMEN,—In the Goulstonian Lectures which he delivered nearly half a century ago the late Sir William Jenner expressed in appropriate language the feelings which should guide the lecturer in the choice of his subject. "It is fitting," he said, "that on this occasion the junior Fellow of the College should treat only of matters concerning which he has reason to hope his knowledge is inferior to that of his hearers in a less degree than on any other." In taking typhoid fever for my subject I trust that I may be fulfilling these conditions. I propose to discuss the pathology of the disease from its bacteriological aspect, for it is in this direction that recent researches have most materially extended our knowledge. To-day I desire, after considering some important points in connexion with the typhoid bacillus itself, to discuss the relationship which the latter bears to an ordinary case of typhoid fever.

Sir William Jenner[2] in his classical paper, published just 50 years ago, showed that in their clinical symptoms and in their morbid anatomy typhoid fever and typhus fever were separate diseases. A few months later, in a paper read before the Royal Medical and Chirurgical Society,[3] he supported his former thesis by proving, so far as inductive reasoning could prove the point, that the specific causes of the diseases were distinct. What the nature of the cause might be he did not discuss. Indeed, the words which Dr. Peter Mere Latham[4] had written some years before still fairly well expressed the difficulty felt by even the very ablest minds in forming any definite conception of the pathology of the infectious diseases. Speaking of the epidemic prevalent at the General Penitentiary in 1825 and speculating on its cause Dr. Latham was obliged to confess that "the present state of our knowledge does not enable us to ascertain what the essence of the disease was, and indeed the search after the essence of any disease beyond the point at which it begins to fall within the reach of the senses has seldom brought the pathologist to any more certain conclusion than this—namely, that it consists in a morbid disposition or action which is *sui generis*." In truth, no further advance was possible until Pasteur had opened up a new world for us by demonstrating the connexion of micro-organisms with disease.

As soon as this had been effected numerous observers turned their attention to typhoid fever, each eager to discover the micro-organism in question. This honour was, however, reserved for Eberth[5] of Zürich who in 1880 succeeded in demonstrating in sections the presence of the true typhoid bacillus in the spleen and mesenteric glands. After its discovery and when its cultural characteristics had been pointed out by Gaffky,[6] it seemed an easy matter to identify the microbe, one or two cultures alone being sufficient to make certain of its identity. In 1885, however, the bacillus coli communis was discovered by Escherich[7] and it rapidly became evident that much greater care would have to be exercised in isolating the real typhoid bacillus. Indeed, so great became the difficulty in distinguishing the typhoid bacillus from some varieties of bacillus coli that in 1890 Rodet and Roux, representing the Lyons school of bacteriology, firmly maintained the view that distinction between them was impossible; that is to say, that by no morphological, cultural, or other tests was it possible to certainly distinguish the typhoid bacillus from members of the coli group, and, in fact, that the typhoid bacillus was nothing more than bacillus coli endowed temporarily with the power of producing a specially virulent toxine and thereby causing the disease. This we now know to be incorrect. It is, without doubt, true that the typhoid bacillus is a member of the great coli family. It is, in fact, nothing more than the member of that family which by a process of evolution has acquired the most highly specialised properties at the expense of some of the more common qualities possessed by the humbler members of the group; but the view that the ordinary bacillus coli communis can be converted at any moment into the typhoid bacillus, or that the reverse can obtain, is not supported by any evidence whatever. The species, though having a common ancestor, are now absolutely distinct. But though this is so, and though with care the typhoid bacillus can be accurately distinguished from the other members of the group, it is by no means a simple matter, and I propose to dwell for a short time on the methods which should be employed for making the diagnosis, more especially as no definite criteria have as yet been agreed upon by bacteriologists, and consequently much valuable work has been vitiated by insufficient testing of the isolated micro-organisms.

THE IDENTIFICATION OF THE TYPHOID BACILLUS.

In the first place, it may be said that there is not the smallest difficulty in distinguishing the typhoid bacillus from what may be called the classical bacillus coli communis. They resemble each other superficially, but differ essentially in that the typhoid bacillus does not, for example, form gas bubbles in dextrose gelatin, does not clot milk, nor form indol. The two can therefore be readily distinguished. The difficulty, however, in diagnosing the typhoid bacillus arises from the fact that the classical or typical bacillus coli communis is by no means the sole representative of this great group. Indeed, we now have to recognise the fact that the term "bacillus coli" does not refer to a single bacillus but to a great group of microbes, some of which are identical with the classical bacillus coli while others very closely indeed resemble the typhoid bacillus. Innumerable intermediate forms also exist. The credit of first thoroughly bringing home this important point belongs to Dr. M. H. Gordon[8] of St. Bartholomew's Hospital who, in an admirable paper published in 1897, very clearly demonstrated its truth. Dr. Gordon obtained from various sources, such as stools, urine, sewage, milk, water, &c., over 100 micro-organisms which resembled the bacillus coli communis morphologically and in its growth on gelatin and agar. He then proceeded to investigate the attributes of each; for example, their power of producing gas and indol, their capacity for acidifying and coagulating milk, the number of their flagella, &c. In this way he was able to demonstrate clearly what had been foreshadowed by Lawes and Andrewes,[9] that the 100 or more microbes, apparently all similar, could really be divided into as many as 16 different and stable varieties, according as they had lost one or more of the properties characteristic of the typical bacillus coli communis. Large as the number may seem, it by no means includes all the varieties known; indeed, to it we must now add several which resemble the typhoid bacillus most closely—for example, Petruchsky's bacillus fæcalis alkaligenes; Gärtner's bacillus enteritidis, Nocard's bacillus psittacosis, Günther's bacillus der fleischvergiftung, Basenau's bacillus morbificans bovis (sometimes grouped together as "the Gärtner group"), and many others, such as, for example, Houston's bacillus typhosus simulans, isolated from Thames mud. These micro-organisms are important in themselves and they derive additional interest from the fact that they are not isolated bacilli but are merely representatives of a large group, continually being added to, from which the typhoid bacillus has to be very carefully distinguished.

In making, then, the diagnosis between the typhoid bacillus and its allies, on what tests should we rely? It may be stated at once that since no test is absolutely specific, with the exception of the one introduced by Pfeiffer, which

[1] Lecture II. was delivered on March 22nd, and Lecture III. will be delivered on March 27th.
[2] On Fevers, London, 1893, p. 3; Edinburgh Monthly Journal of the Medical Sciences, 1849-50.
[3] Ibid., p. 139; Transactions of the Royal Medical and Chirurgical Society, vol. xxxiii.
[4] An Account of the Disease Lately Prevalent at the General Penitentiary, London, 1825, p. 140.
[5] Virchow's Archiv, Band lxxxi., 1880, and Band lxxxiii., 1881.
[6] Mittheilungen aus dem Kaiserlichen Gesundheitsamte, Band ii., 1884
[7] Fortschritte der Medicin, 1885.
[8] Journal of Pathology and Bacteriology, 1897.
[9] London County Council Reports, 1894.

in England at least is not always easy to perform, reliance must be placed on a series of tests. Let us now consider the most important of these and how they should be applied.

Morphology and motility.—In the first place, it should be noticed that an examination of the micro-organisms under the microscope often gives valuable indications provided that a fresh gelatin culture be used (agar cultures being much less distinctive) and that the examination be made in a drop of broth. Under these circumstances the greater length of the typhoid bacilli, their greater motility, and especially the curious serpentine movement of the longer forms, should at once suggest this micro-organism. Unfortunately, however, it cannot do more, for Gärtner's bacillus, Günther's bacillus, and Nocard's bacillus psittacosis, unlike the commoner varieties of the coli group, *exactly* resemble the typhoid bacillus in these respects. Still, the tests are of value in suggesting the presence of the typhoid bacillus and in excluding many of the commoner varieties of bacillus coli.

Recently, however, it has been shown that bacilli exactly resembling each other in appearance, size, and motility may yet differ radically in the shape and number of their flagella, and the point is of some importance in the diagnosis of the typhoid bacillus. Thus the flagella of this micro-organism are long and wavy and from eight to 12 in number on each bacillus, while those of the ordinary bacillus coli are shorter and vary in number from one to three. Until quite recently, therefore, it was thought that here bacteriologists possessed an infallible means of differentiating the two micro-organisms. But this is not so, for though the majority of the members of the coli group have but from one to three flagella, there are others which possess more, while one or two of the higher members of the group are multi-flagellated in exactly the same way as is the typhoid bacillus. These variations in the number of the flagella possessed by members of the coli family are well shown in the accompanying reproductions of photographs, for which I am indebted to the kindness of Dr. Gordon. We see from them that while very often it is possible to distinguish the typhoid bacillus from its allies by the flagella test, yet sometimes this fails. Thus bacillus enteritidis, and probably also Nocard's bacillus, exactly resemble the typhoid bacillus, in this respect. As a rule, however, even in the multi-flagellated forms, slight differences can be made out and the test, therefore, is of very considerable importance. Thus the bacillus represented in photograph 1 was a variety of bacillus coli, which formed no gas, did not clot milk, and formed no indol, but the number and arrangement of its flagella at once enabled it to be distinguished from the typhoid bacillus. In all cases of doubt, therefore, the flagella should certainly be stained.

Cultivation tests.—I do not propose to say anything about the growths of this great group of microbes on surface gelatin or agar, for the shades of differences noticed are too fine to be of any value as differential tests. Nor need I delay over the potato culture, hallowed though it be by tradition, owing to the fact that it was introduced by Gaffky himself, who first succeeded in cultivating the bacillus. The invisible growth, however, which may occur in the case of the typhoid bacillus if the reaction of the potato be suitable is not uncommonly also obtained with other members of the coli group, especially the higher members, and the test therefore becomes of but little use. So, too, with Elsner's medium, at first so much vaunted. According to my experience many varieties of bacillus coli grow on it exactly like the typhoid bacillus, and the medium, difficult at any time to prepare, becomes therefore of but little value.

Dextrose-agar and dextrose-gelatin.—Extremely important, however, as differential tests are the dextrose-agar and dextrose-gelatin shake cultures; probably, indeed, of all the culture tests they are the most important. Their value depends on the fact, first pointed out in 1890 by Theobald Smith,[10] that typhoid bacilli, grown in a medium containing 2 per cent. of dextrose, never decompose the latter with the formation of gas bubbles, while numerous members of the coli group do. Gordon, working with dextrose-gelatin, found that of his 16 varieties 11 produced the phenomenon, while the remaining five did not. Experience, however, shows that, contrary to the former tests, the chief members of the Gärtner group, otherwise closely allied to the typhoid bacillus, are sharply differentiated by this test. Thus of the four examples which I have been able to examine all gave a positive result. Petruchsky's bacillus fæcalis alkaligenes, however, is an exception; like the typhoid bacillus it forms no gas bubbles. As a rule, too, gas bubbles, if they are going to appear, generally are seen within 24 or 48 hours; occasionally, however, in dextrose-gelatin at least, they are delayed, it may be as long as for 10 days. If this medium be used it is well, therefore, to keep the tubes for a month before deciding that the reaction is really negative—the tests, then, are of the highest value, for though by no means conclusive in themselves, they yet often effect a distinction exactly in the cases where it is most required.

Litmus milk.—Another very important test is the litmus milk test. Originally introduced in 1891 by Chantemesse and Widal,[11] it was perfected in the following year by Dunbar,[12] who pointed out the importance of noticing the change of reaction as well as the presence or absence of coagulation. Grown in this medium and incubated at 37° C. the typhoid bacillus rapidly produces a slight acidity in the milk, but never, even after some months, does it coagulate the latter. With the typical bacillus coli communis, however, the reverse obtains, for the milk is clotted in from 24 to 48 hours, while the amount of acidity formed is greatly in excess of that ever produced by the typhoid bacillus. What, now, are the limitations of the test? 1. First, as regards the coagulation of the milk. Here, again, as with so many other tests, it is by no means infallible. Gordon found that 10 out of his 16 varieties of bacillus coli clotted while the other six failed to do so; moreover, of the four highly specialised members of the group which I have examined each had lost this power and so by this test could not be distinguished from the typhoid bacillus. A point of great importance to be borne in mind in conducting the test is that the coagulation of the milk in these cases is not uncommonly long delayed. As a rule it occurs within the first four days, but it is by no means rare with the less common varieties of bacillus coli to find it occurring first in the second, the third, or even the fourth week after inoculation of the tube. The lesson, therefore, to be drawn from this fact is that every tube should be observed for at least a month before stating that the result is negative. 2. Secondly, with regard to the production of acidity. This, I believe, is subject to less variation than the power of clotting milk, that is to say, that most varieties of bacillus coli form acid rapidly and form it more abundantly than does the typhoid bacillus. But, unfortunately, the test fails when we come to the more highly differentiated forms, for the Gärtner group all produce approximately the same amount of acid in milk as does the typhoid bacillus. So far I have spoken of the acidity, noticed up to the end of a week, the time usually allowed by observers before the tube is cast aside. If, however, the tubes be kept for a month before being discarded, as I have suggested, further important changes in the reaction may often be observed. Thus even at the end of this period the reaction of a typhoid milk culture is still nearly always acid. Such, at least, has been the case in the great majority of the different typhoid bacilli, over 20 in number, which I have examined. Occasionally, however, the reaction has been faintly alkaline. Supposing, however, we take the cultivations not of the typhoid bacillus but of the other highly specialised members of the coli group, bacillus enteritidis and its allies, we find that in certain of them, Gärtner's bacillus itself for example, at the end of a month the reaction is highly alkaline and has acquired a curious but very definite slaty blue colour. Without going so far as to affirm that a typhoid bacillus could never give rise to such a change of reaction we may say at least that it can only rarely occur, and we should do well, therefore, to regard all such bacilli with grave suspicion until their identity with the typhoid bacillus has been otherwise most fully proved. We, may, then, affirm that the litmus milk test is of considerable value as a means of distinguishing the typhoid bacillus from the varieties of bacillus coli, if performed in the manner suggested, that is to say, if the culture is kept at 37° C. for at least one month. If discarded at the end of a week, as is the usual procedure, valuable indications are often lost.

Indol test.—Another test commonly applied to distinguish the typhoid bacillus is the indol test, introduced by Kitasato[13] in 1889. The bacilli are grown in broth at 37° C.,

[10] Centralblatt für Bakteriologie, 1890, vol. vii., p. 504.

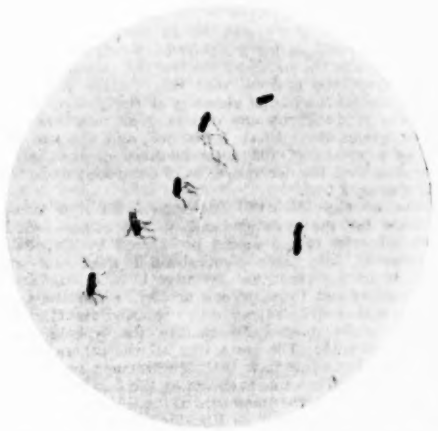
[11] Société de Biologie, Paris, Nov. 7th, 1891, p. 747.
[12] Zeitschrift für Hygiene, Band xii., 1892, p. 491.
[13] Ibid., Band vii., 1889, p. 515.

PHOTOGRAPHS SHOWING THE VARIATIONS IN FLAGELLA POSSESSED BY DIFFERENT MEMBERS OF THE COLI FAMILY (PREPARED BY VAN ERMENGEM'S METHOD).

FIG. 1.

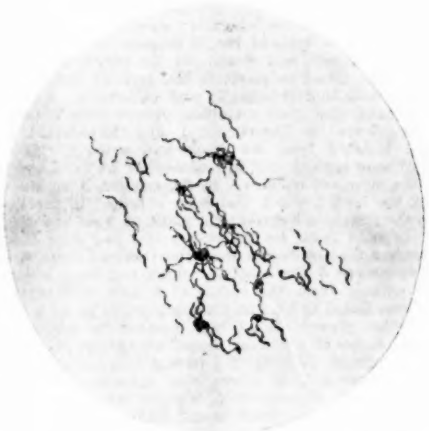
Bacillus Coli: variety (*a*), × 1000. This organism did not form gas or indol and did not clot milk.

FIG. 2.



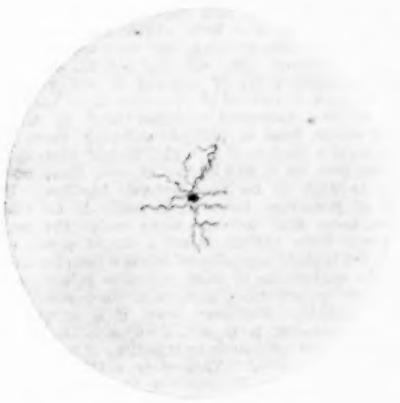
Bacillus Coli: variety (*b*), × 1000. This organism formed both gas and indol and also clotted milk.

FIG. 3.



Bacillus Coli: variety (*c*), × 1000. This organism formed both gas and indol but did not clot milk.

FIG. 4.



Gärtner's Bacillus Enteritidis, × 1000.

FIG. 5.

Bacillus Typhosus, × 1000.

and the cultures are tested at the end of a variable time, generally one week, to see whether indol is present in them or not. Typhoid bacilli under these conditions never form indol, various members of the coli group do. If the test is to be of any real value, however, it must not be performed before the end of one month, for in many cases the formation of the indol is much delayed. Even, however, if we take a month as the standard the test not uncommonly fails, and it should be noticed that this failure is especially common among the higher members of the group. Thus no indol was produced by any of the four members of the Gärtner group which I have examined, and the test, therefore, as a means of diagnosis becomes of infinitely less importance than the dextrose-agar or dextrose-gelatin test or the litmus milk test.

Media of Capaldi and Proskauer.—We now come to two tests for the typhoid bacillus which are too little known. I refer to the media introduced by Capaldi and Proskauer.[14] Into their composition I need not enter; suffice it to say that in Medium I. the bacillus coli grows readily and forms strong acidity, while the typhoid bacillus will not grow at all; in Medium II., on the contrary, while both grow readily the typhoid bacillus alone forms acid. The tests, like all the others which we have been discussing, have their limitations; but that they are of considerable value is shown by the fact that by means of them two of the four members of the Gärtner group which I have examined, as well as Houston's four bacilli (bacillus typhosus simulans, *a*, *b*, *c*, and *d*), were at once differentiated from the typhoid bacillus. In these media, then, we have a valuable auxiliary means of distinguishing the typhoid bacillus from the other members of the coli group, rendered more important by the fact that the reaction is quickly given (in from 24 to 48 hours) and that the media can be easily prepared.[15]

Serum test.—We may now pass to the serum test, the most important of the tests which are commonly employed for the identification of the typhoid bacillus. This test, however, like all the others, only becomes of real diagnostic value if applied in the proper way. A not uncommon method of procedure is to take a broth culture of the suspected bacillus and to add to it sufficient serum from a patient suffering from typhoid fever to make a dilution of 1 in 20. Should clumping occur within an hour, or it may be two or even three hours, the bacillus is said to be the typhoid bacillus. Such a method of procedure, however, is really of no value, for we now know that in very many cases the serum of the typhoid fever patient is not a simple serum containing only the typhoid agglutinins but is a complex body containing the agglutinins of other microbes as well, and often those which we are most anxious to distinguish from the typhoid bacillus. Moreover, even if a simple typhoid serum is used—that is to say, a serum obtained from an animal immunised artificially by injections of typhoid culture, a fallacy may come in. Thus it is well known—it was, indeed, pointed out by Durham[16] in his earliest communication on the subject—that these sera are not "specific" but rather "specialised." The result is that if a very strongly agglutinating typhoid serum is used and a dilution of merely 1 in 20 be employed a bacillus, allied to the typhoid bacillus, but *not* the typhoid bacillus, may be clumped. Thus it was shown that Gärtner's bacillus may be agglutinated under these conditions, and other microbes of a similar kind also exist.

How, then, should the test be applied so as to guard against the possibility of such errors? In the first place, where possible a simple typhoid serum should be used for the test, that is to say one obtained from an animal highly immunised against the typhoid bacillus. Where, however, as is commonly the case, this is impossible, and a serum from a typhoid patient has to be employed, it should be one which agglutinates strongly, at least in dilutions of 1 in 1000, and the following method of procedure should be used. The serum should be tested against the standard typhoid bacillus (agar cultures in all cases being used) and the highest dilution in which a complete reaction is obtained in one hour should be worked out. When this is done then the unknown bacillus must be tested in like manner so that the maximum agglutinating power of the serum towards it may be also determined. If then the two prove equally sensitive towards the serum, each giving a complete reaction in one hour to a similar high dilution, then it may be said for certain, *provided it has answered the other tests*, that the unknown bacillus is also the typhoid bacillus; for experience shows that though a typhoid serum may agglutinate other microbes, for example, Gärtner's bacillus, as well as the typhoid bacillus, yet it probably never clumps the former in dilutions over 1 in 500 (Durham)[17] and indeed very rarely reaches such a height. If, then, the serum test, applied in this way, has given a positive reaction and the morphological and cultural tests are also affirmative, then we may be certain that the bacillus is also the typhoid bacillus.

Variations in clumping power according to the culture used; necessity of using cultures on solid media in testing typhoid bacilli.—Is, however, the converse true? Are we justified in saying that a bacillus which is only slightly sensitive to a strong typhoid serum is therefore not the typhoid bacillus, even though in all other respects it may resemble the latter? In other words, are all typhoid bacilli agglutinated by a given serum to an exactly equal extent? The majority of observers, Widal,[18] Bensaud,[19] Durham,[20] and others, have not noticed marked differences in this respect, and they believe, therefore, that typhoid bacilli from every source are agglutinated approximately to the same degree. Van de Velde,[21] however, from his observations on 20 different typhoid stocks found very considerable variations in the clumping power. The following observations are of interest in this connexion, for they show that using 18-hour broth cultures, as is now the usual practice, undoubtedly marked variations in the clumping power of different typhoid bacilli do exist. In these experiments typhoid sera of different typhoid clumping power were tested against the laboratory standard typhoid bacillus and also against typhoid bacilli isolated from stools, urine, mesenteric glands, and spleen—bacilli which, be it remembered, were found to resemble the typhoid bacillus in all respects both morphologically and culturally. As a result it was found that their clumping powers were by no means similar. Thus in Experiment 1 and Experiment 2 the bacilli isolated from the stools and urine of the same patient were agglutinated to a somewhat higher degree than was the standard bacillus. In Experiment 3, on the other hand, the bacilli which had been obtained in pure culture from the spleen and mesenteric gland of a patient who died from typhoid fever on the twenty-first day were found to clump in a far less degree than the standard bacillus, while in Experiment 4 the bacillus, which had been isolated in pure culture from the spleen of a fatal case of typhoid fever was found to have no clumping power at all in a 1 in 20 dilution, though tested both against the highly agglutinating blood of a patient inoculated against typhoid fever and also against the milk of a patient who had recently had typhoid fever and in whom this secretion was strongly agglutinating. Experiment 5, also, is interesting. In this case two standard typhoid bacilli, both of which, that is to say, had been used in the routine work of the laboratory and which were very sensitive to typhoid serum, were tested against a feebly agglutinating serum, and the difference in their agglutinable power was distinct. The one clumped fairly in a 1 in 100 dilution, the other only in a dilution of 1 in 20. (See Table I.)

There can be no doubt, then, that if broth cultures be used typhoid bacilli often differ markedly among themselves in the ease with which they are affected by the typhoid agglutinins. But is this difference constant and have we here evidence of "varieties" of typhoid bacilli? It would seem not, for if we use cultures on solid media (agar and gelatin) this variability seems much less marked. This was especially noticeable in the case of the bacillus in Experiment 4, which, though it reacted like typhoid to all the morphological and culture tests enumerated above and had been obtained in pure culture from the spleen in an early fatal case, yet neither was agglutinated by typhoid serum when tested by Dr. Andrewes, nor by the typhoid milk when tested by myself. Feeling certain, however, that the bacillus *was* the typhoid bacillus I tried once more, but on this occasion used an agar culture (18 hours), testing it against a second sample of milk obtained from the same

[14] Ibid., Band xxiii., p. 471.

[15] Medium I. is composed as follows: asparagin, 0·2; mannite, 0·2; sodium chloride, 0·02; magnesium sulphate, 0·01; calcium chloride, 0·02; mono-potassium phosphate, 0·2; and distilled water, 100. Medium II.: Witte's peptone, 2·0; mannite, 0·1; and distilled water, 100.

[16] Proceedings of the Royal Society, vol. lix., Jan. 3rd, 1896.

[17] THE LANCET, Jan. 15th, 1898, p. 154.

[18] Annales de l'Institut Pasteur, 1897, p. 364.

[19] Thèse de Paris, 1897, p. 65.

[20] Journal of Pathology and Bacteriology, July, 1896.

[21] Bulletin de l'Académie de Belgique, 1897, ii., p. 261.

patient as before. A very different result was now obtained. After mixing the culture and the milk agglutination immediately became apparent in a dilution of 1 in 20, and in a few minutes was complete, while in a dilution of 1 in 500 a complete reaction was obtained within the hour—a result exactly similar to that given by the standard typhoid bacillus when tested against the sample of milk now under consideration.

This same extraordinary difference in sensibility to agglutination between broth and agar cultures I have noticed in the case of five other typhoid bacilli, isolated from different patients (and in a seventh case a similar result was obtained on using a gelatin culture), so that probably it is not really very uncommon. It is possible, too, that it should be associated with a fact observed by Kraus.[22] This experimenter showed that if broth cultures of the typhoid bacillus be incubated for some days and be then filtered the filtrate gave rise on the addition of typhoid serum to a precipitate closely resembling in appearance that produced by agglutinated micro-organisms. The reaction was *specific* and only occurred when typhoid serum was added. It may be that the constituent of the bacillary body, on which the agglutinins act, and which thus seems normally to pass into the surrounding liquid, may in some cases diffuse much more easily, and even after 24 hours be no longer present in the bacilli themselves. We should thus have an easy explanation of the absence of the reaction in the broth-grown bacilli and its presence in those obtained from solid media. Be this as it may, the obvious moral to be drawn from the fact is that in testing the agglutinable qualities of a suspected bacillus cultures on solid media should always be used, and especially therefore agar cultures.

So far, too, though my experiments are not numerous enough for me to speak with certainty, I have not noticed more than slight differences between different typhoid bacilli, provided agar cultures be compared. The experiments of Dr. Klein,[23] however, showing that under abnormal conditions the agglutinable property of the cholera vibrio can be lost, should warn us not to be too dogmatic on this point in the case of the typhoid bacillus. Indeed, the matter requires further investigation.

[22] Wiener Klinische Wochenschrift, August 12th, 1897, No. 32.
[23] Report of the Medical Officer of the Local Government Board, 1896–1897.

Pfeiffer's test.—Should, however, a bacillus be discovered which culturally or morphologically resembles the typhoid bacillus in all respects and which yet agglutinates but feebly or not at all, then one further test must be applied to it—namely, Pfeiffer's test. This consists in injecting into the peritoneum of a guinea-pig a 10 times fatal dose of the bacillus in question, together with a very small quantity (0·001 cubic centimetre may be quite sufficient) of typhoid serum from a highly immunised animal. If the bacillus in question be the typhoid bacillus, then while a control animal injected *only* with the bacillus will die this animal will recover, the bacilli being converted first into granular masses (Pfeiffer's phenomenon) and then gradually disappearing under the influence of the lysogenic properties of the serum. Such a serum, however, is *specific*, and can therefore only protect, in minute doses, against the corresponding micro-organism. If, therefore, the bacillus in question be not the typhoid bacillus, but some variety of bacillus coli, the animal will infallibly die just like the control animal. This test is of the highest importance, for if properly performed a positive result is infallible. It is unfortunate, therefore, that the test, owing to the difficulties connected with it, cannot be made of more general application. It should, however, always be applied in any case in which there can be doubt as to the nature of the micro-organism. If, for example, a bacillus which should fail to agglutinate nevertheless should react like the typhoid bacillus to this test, then we must accept it as the latter.

Such, then, are the most important methods which we possess for the identification of the typhoid bacillus. Without doubt by far the most important of these are the last two, the agglutination test carried out in high dilutions and Pfeiffer's test, but the others cannot be neglected. Indeed, in view of the extreme importance of the subject it would be well if before pronouncing any bacillus to be the typhoid bacillus, more especially if it be found in some unusual situation, whether within or without the body, the micro-organism were subjected, as a minimum, in all cases to the following tests which for convenience I here recapitulate: (1) morphology and motility (as observed on gelatin); (2) flagella; (3) gelatin and agar slope culture; (4) dextrose-agar or gelatin shake cultures, preferably the former; (5) litmus milk (one month); (6) broth culture (no indol—one

TABLE I.—VARIATIONS OF CLUMPING POWER MANIFESTED BY BROTH CULTURES OF DIFFERENT TYPHOID BACILLI.

—	Agglutinating strength of the given serum, as tested against a broth culture of the standard typhoid bacillus used in the laboratory for Widal examinations.	—	The same serum tested against the broth cultures of various other typhoid bacilli. Time limit in all cases one hour.
Experiment 1.—Serum (*a*) from a typhoid patient.	1.20 = + 1.200 = + 1.500 = + 1.1000 = + 1.2000 = trace.	Typhoid bacilli isolated from stools.	Col. I. 1.500 = + 1.1000 = + 1.2000 = just + Col. II. 1.500 = + 1.1000 = + 1.2000 = just + *Result.*—The bacilli clump a little more readily than the standard typhoid bacillus.
Experiment 2.—Serum (*b*) also from a typhoid patient.	1.200 = + 1.500 = partial. 1.1000 = 0	Typhoid bacilli isolated from urine.	Col. I. 1.200 = + 1.500 = just + 1.1000 = partial. Cols. II. and III. Gave a similar result. *Result.*—As in Experiment 1 the bacilli are rather more sensitive than the standard typhoid bacillus.
Experiment 3.—Serum (*c*) also from a typhoid patient.	1.20 = + 1.200 = + 1.1000 = partial. 1.2000 = trace.	Typhoid bacillus isolated from the spleen and mesenteric gland from a case fatal on the twenty-first day.	Spleen Col. I. 1.20 = + (just). 1.200 = trace. Mesenteric gland, Col. I. 1.20 = + (just). 1.200 = trace. *Result.*—The bacilli are far less sensitive than the standard typhoid bacillus.
Experiment 4.—(I.) Serum (*d*) from a patient inoculated against typhoid fever.	1.2000 = +	Typhoid bacillus isolated in pure culture from the spleen of an early fatal case.	1.20 = 0
(II.) The milk of a woman who had recently had typhoid fever.	1.20 = + 1.500 = + 1.1000 = +	"	1.20 = merest trace. 1.500 = 0 *Result.*—The isolated typhoid bacillus does not clump at all.
Experiment 5.—Serum (*e*) from a typhoid patient.	Standard bacillus I. 1.20 = + 1.50 = + 1.100 = partial. 1.200 = trace. 1.500 = 0	—	Standard bacillus II. 1.20 = + 1.50 = trace. 1.100 = 0 1.200 = 0 1.500 = 0 *Result.*—Standard bacillus I. is more sensitive than standard bacillus II.

month); (7) Proskauer and Capaldi medium 1 (no growth 48 hours); (8) Proskauer and Capaldi medium 2 (growth and acidity 48 hours); (9) agglutination test (high dilutions—1 in 1000 at least—agar cultures); and (10) in cases of doubt Pfeiffer's test.

These tests are long and tedious, but it must be borne in mind that we know very few of the saprophytes with which we are surrounded and that at any moment one may be discovered having greater affinities with the typhoid bacillus than those already described. Remembering, too, the history of our subject it behoves us to use exceptional care, for only in this way can we hope that our results may withstand the just criticism of future observers.

THE TYPHOID BACILLUS AS A SAPROPHYTE.

The life-history of the typhoid bacillus may be divided into two great chapters—the one dealing with the bacillus in its relation to the human body, the other describing its existence after leaving the shelter of the organism. It is to the former of these that I propose chiefly to confine myself, for our knowledge of the latter phase of the life-history of the micro-organism is as yet most limited. We are ignorant indeed whether under the conditions found in nature the bacillus can ever multiply and increase in numbers, or whether after a longer or shorter duration it gradually dies out.

The former view was recently brought forward by the late Sir Richard Thorne Thorne from a consideration of the fact that it was otherwise very difficult to explain the endemic character of typhoid fever in certain towns and districts. At the present time, however, the view is unsubstantiated by bacteriological evidence. It is true that, as Dr. Sidney Martin[24] has shown, the typhoid bacillus can multiply if implanted in organically contaminated soil previously sterilised, but whether it would also multiply were the soil unsterilised and were it therefore exposed to the inevitable struggle for existence has not yet been shown. Indeed, the work of Lawes and Andrewes who showed that the typhoid bacillus rapidly died out if planted in sewage, whether sterilised or not, would rather suggest the improbability of its doing so.

Again, in support of the active saprophytic growth of the typhoid bacillus the very careful observations of Lösener[25] have been cited. In 1895 this observer, using all the means of differentiation then at his command, was able to find bacilli quite indistinguishable from the typhoid bacillus in very various situations, for instance, in the intestines of a pig, the water of his laboratory, and in a specimen of uncontaminated soil. Unfortunately, however, neither the serum nor Pfeiffer's test were then available, so that we are not justified in concluding that the bacilli in question really were the typhoid bacilli. On the contrary, the extraordinary difficulty experienced in finding the latter in water obviously specifically polluted would suggest that they were not.

We must allow, then, that so far there is no proof that the typhoid bacilli can multiply outside the human body. Our increasing knowledge of typhoid fever, too, enables us to explain satisfactorily many outbreaks of the disease without such an assumption. Thus it is fully established that a person may, though apparently restored to health, remain infectious for months and years after an attack of the fever—a fact in itself sufficient to account for many outbreaks of the disease. If, too, we remember that the bacillus has great power of resisting the effect of desiccation, remaining alive, it may be, for over a year in the dried condition (Schiller),[26] it becomes easy to understand how bacilli eliminated from the body may later pass into the atmosphere in the form of dust and cause disease at long periods after every fresh source of infection has been really removed. These facts should, in many cases at least, render unnecessary a belief in the actual growth of the bacillus outside the human body. The question, however, is one which the future alone can finally settle.

THE TOXINES OF THE TYPHOID BACILLUS.

The pathology and symptoms of any infectious diseases are intimately bound up with poisons elaborated by the micro-organism in question. This subject was recently brought before the College by Dr. Sidney Martin in his Croonian Lectures, and I will not now do more than draw attention to two points in connexion with the toxines formed by the typhoid bacillus. The first point to note is that the poison is for the most part intracellular. It is contained in the bodies of the bacilli themselves and during their life passes only to a comparatively slight extent into the surrounding medium. Funck,[27] indeed, came to the conclusion that this never occurred, and this though he used both ordinary bacilli and also those whose virulence had been considerably heightened by successive passages through the guinea-pig. In both cases he found that if broth cultures were made and incubated at 37° C. for at least a month and then filtered through a Chamberland's bougie, the filtrate was innocuous. This, too, was my own experience, using a typhoid bacillus recently isolated and possessing moderate pathogenic power. Thus in the case of a rabbit whose initial weight was 1360 grammes I injected intravenously, in three successive doses, 18½ cubic centimetres of a filtered broth culture, the latter having been previously incubated at 37° C. for 42 days. This was followed 10 days later by a single subcutaneous injection of 18 cubic centimetres of the same filtered culture. A week later the animal was killed, four weeks from the initial injection. During the injections it had appeared in perfect health, its temperature had remained normal, and at its death it had gained 231 grammes. Post mortem, beyond slight parenchymatous changes in the liver and kidney nothing abnormal was observed. The poisonous characters of the filtered culture were therefore in this case almost *nil*.

There is no doubt, however, that in some cases the toxines do diffuse somewhat into the surrounding liquid. Thus Dr. Sidney Martin[28] was able on several occasions to produce lowered temperature, diarrhœa, and eventually death, by the injection of small doses (three cubic centimetres) of the filtered culture. But although this is so, and though there can be no doubt that sometimes to a slight extent the toxines do pass into the culture media, it remains true that the poisons are for the most part intracellular—a fact at once proved by noticing the incomparably greater effect produced on the animal by the injection of cultures in which the bacilli have been killed, but their bodies have been allowed to remain in the liquid. It may be accepted, then, that the toxines of the typhoid bacillus are for the most part contained within the bacillus itself and are chiefly set free when the latter is destroyed. The fact is of interest from a clinical point of view, for it shows that even when the body has acquired in a case of typhoid fever sufficient bacteriolytic power to destroy the bacilli we ought not to expect, in the absence of antitoxin formation, of which as yet there is no evidence, an immediate fall of temperature. The first effect, indeed, of the destruction of the bacilli would be a further outflow of poison into the general circulation, and only as this is gradually excreted should we expect the temperature to fall. In this way an explanation offers itself of the fall by lysis which is so characteristic of the disease.

The second point which it is of interest to note is that the toxine is a very feeble one as compared with those of certain other micro-organisms. Thus, in order to kill a guinea-pig of 300 grammes weight Sanarelli[29] had to use a subcutaneous injection of 4·5 cubic centimetres of his toxine, while in the case of tetanus Vaillard was able to obtain a solution $\frac{1}{3000000}$ cubic centimetre of which was able to kill a guinea-pig. In the case of diphtheria, too, the dose necessary may be extremely small. It is obvious, then, that to explain the symptoms of typhoid fever the number of bacilli present in the body should be very large, so that sufficient toxine may be formed. As we shall see, this is what does occur. So far from being limited to one situation, as in tetanus, the bacilli find their habitat in many organs and in diverse situations of the body and are present in enormous numbers.

EXPERIMENTAL TYPHOID FEVER.

Before a given micro-organism can be accepted as the cause of a disease two points must be clearly established. In the first place the organism must be constantly present in the tissues of patients suffering from the disease, and secondly, the bacillus, having been obtained in pure culture and grown artificially through several generations, must be able to reproduce the disease.

With regard to typhoid fever there can be no doubt about the former of the two premisses. The bacillus is present in the body in all cases of the disease. Indeed, this is so well recognised abroad that puncture of the spleen with the object of isolating the bacillus is one of the recognised

[24] Report of the Medical Officer of the Local Government Board, 1896-1897.
[25] Arbeiten aus dem Kaiserlichen Gesundheitsamte, ii., 1895, p. 207.
[26] Ibid., 1889, Band v., pp. 312 to 319.
[27] La Sérothérapie de la Fièvre Typhoïde, Bruxelles, 1896, pp. 34 to 38.
[28] Croonian Lectures, Brit. Med. Jour., vol. ii., 1898, pp. 11 and 73.
[29] Annales de l'Institut Pasteur, 1894, p. 198.

means of clinical diagnosis practised by the continental physician. Is, however, the second premiss true. Can the bacillus when reintroduced again give rise to the disease? For a long time this was doubted, innumerable attempts to reproduce the disease in animals, both by feeding and by inoculation, having resulted in failure. Animals, in fact, as a rule are not susceptible to typhoid fever such as it occurs in man. The observations of Mr. Bland Sutton,[30] however, on the animals (lemurs, monkeys, beavers, &c.) in the Zoological Gardens seemed to show that, under certain conditions at least, the lower animals could suffer from true typhoid fever. At all events, the clinical symptoms in these animals,-fever, in some cases of six weeks' duration, and diarrhœa, the ulceration of the Peyer's patches and solitary follicles found post mortem, and the mode of death, brought about in one case at least by general peritonitis and in another by sudden hæmorrhage from the bowel, gave a picture quite indistinguishable from the disease occurring in man. Moreover, this disease was raging in the neighbourhood at the time. It was reasonable, therefore, to hope that further persistent effort might eventually result in producing by means of the typhoid bacillus typical typhoid fever, and it would seem that Remlinger has lately succeeded where so many others have failed. His experiments, it should be noticed, were carried on during the summer in Tunis, and it is conceivable that the tropical climate may by its effect on the animals have had something to do with the successful result. Remlinger[31] experimented first on rabbits. His method consisted in feeding them on vegetables previously soaked in water largely diluted with typhoid cultures. Under this treatment and after a short incubation period three of the eight rabbits used became ill. The temperature rose gradually and remained raised; the animals were affected with diarrhœa and they refused food and rapidly lost weight. The temperature charts strongly resembled in appearance those of typhoid fever, the temperature remaining up for from 12 to 16 days. In two cases death followed and in one recovery. In all three cases Widal's reaction, 1 in 50, was obtained from the blood during life. In the two cases which died the post-mortem appearances obtained were those of typhoid fever. The ileum was found to be much injected, the Peyer's patches were swollen and hypertrophied, and near the cæcum there was some ulceration. The mesenteric glands were swollen, the spleen was enlarged, and in one case diffluent. In both cases typhoid bacilli were isolated from the latter organ. With white rats, also, a very similar result was obtained. It would seem, then, that there cannot be any further doubt that typhoid fever can be communicated to animals by means of the typhoid bacillus. The last link, therefore, in the chain of evidence proving the causal connexion of the bacillus with the disease may be regarded as complete.

HUMAN TYPHOID FEVER; THE DISTRIBUTION OF THE BACILLUS IN THE BODY.

I may now pass from the disease experimentally induced in animals to typhoid fever as it occurs in man, and I propose first of all to discuss the relationship which the bacillus bears to an ordinary case of the disease. This may be best effected by considering in such a case what are the situations of the body in which the bacillus may be found.

Mesenteric glands and spleen.—Eberth,[32] the discoverer of the bacillus, was able to demonstrate its presence microscopically in the mesenteric glands and in the spleen. He did not, indeed, find the bacillus in all cases, but he was successful six times in the spleen and 12 times in the mesenteric glands out of 23 cases which he examined. Further investigation, however, not only confirmed his discovery but showed that the presence of the micro-organisms in these situations was constant. In rare cases, it is true, a culture from either organ may remain sterile, but this doubtless arises from the curious manner in which the bacilli are scattered in little masses through the tissue so that occasionally the inoculating needle fails to come in contact with them.

Peyer's patches.—With regard also to the Peyer's patches themselves and the solitary follicles of the intestine there is no doubt that, if examined early enough, typhoid bacilli may be demonstrated therein.

The liver.—Another organ in which the typhoid bacillus is constantly present is the liver. Thus Gaffky found it here in 12 out of his 13 examinations, and his results have been fully confirmed. In the liver again, just as in the Peyer's patches, the mesenteric glands, and the spleen, the typhoid bacilli are found aggregated together into their little characteristic masses. It might at first seem somewhat surprising that the liver should contain the typhoid bacillus, but it is not difficult to explain. As we shall see, the bacilli must in all cases at some period of the disease pass into the blood and hence be first carried to the liver. Now this organ, as Lemaire[33] has clearly shown, undoubtedly plays a very active part in eliminating the typhoid bacillus from the circulation, even more so than the spleen. For both reasons, therefore, it is easy to understand how the liver comes to be a constant habitat of the bacillus in typhoid fever.

The bile.—This, however, has been known for long. Much more recent is the knowledge that the bile in the gall-bladder in the majority of cases contains the bacillus, very often in pure culture. For this advance in our knowledge we are especially indebted to Chiari[34] who in 1893 examined the bile in 22 cases of typhoid fever, and in 19 of them found the typhoid bacillus therein. Moreover, in 15 of these it was present in pure culture. Somewhat similar results had, indeed, been obtained before experimentally. Thus Blachstein and Welch[35] in 1891 showed that if mild doses of typhoid culture were injected intravenously into rabbits, on examination after death the bile would often present a pure culture of the typhoid bacillus. To Chiari, however, belongs the credit of demonstrating the fact in cases of typhoid fever in man and his observations have been fully confirmed. Thus in 10 cases at St. Bartholomew's Hospital in which the bile was examined, in nine of them was the bacillus found; in each case also it was in pure culture. Flexner[36] was, however, less fortunate, finding them only in seven out of 14 examinations. It should be noticed, also, that in very many cases the micro-organisms are present in great numbers, so that if a drop of bile be examined under a microscope numerous bacilli may be seen.

The bone marrow.—Another situation, also, in which the bacilli have been recently demonstrated with great frequency is the bone marrow. This was shown as recently as 1894 by Quincke.[37] He examined the marrow of the ribs in nine cases and in eight of them he found the typhoid bacillus in considerable numbers. In seven the bacilli were present in pure culture. His method of diagnosing the bacilli, it is true, left much to be desired; still there is no doubt from the confirmation which his observations have received that the bacilli found by him were really true typhoid bacilli. At St. Bartholomew's Hospital the bone marrow has been examined in six cases and in four of them a pure culture of typhoid bacilli was obtained. In the other two cases typhoid bacilli were not found, but only bacillus proteus vulgaris and bacillus coli.

The kidney.—We may now pass to another organ which contains sometimes the specific micro-organism—namely, the kidney. As a matter of fact, however, in contradistinction to what we have seen to be true for the liver, the spleen, and the mesenteric glands, the bacillus is by no means constantly found here. Its presence, indeed, is exceptional. Thus, to mention only recent observations, Flexner[38] found it here in one case out of four, in addition to two cases of obvious typhoid septicæmia in which the bacilli were found in the blood and all the organs after death. Wright and Stokes[39] found it in three cases out of seven. For myself I may say that I have examined the kidneys bacteriologically on eight occasions. Twice only were the typhoid bacilli found, and in both of these the micro-organism was present in large quantities also in the blood. In the remaining cases the kidneys were sterile three times, and on three occasions they contained bacillus coli communis, twice in pure culture and once combined with bacillus proteus vulgaris. We shall probably, therefore, be not far wrong if we conclude that it is the exception rather than the rule for typhoid bacilli to be found in the kidney after death, though in rare cases, as I shall show, it may become localised here and give rise to an acute nephritis. Although, however, this is so, it is probable that during life it is by no means uncommon for

[30] Transactions of the Pathological Society of London, 1885.
[31] Annales de l'Institut Pasteur, 1897, p. 829.
[32] Loc. cit., vide note 5.
[33] Archives de Médecine Expérimentale, Septembre, 1899.
[34] Zeitschrift für Heilkunde, xv, 1894, p. 199.
[35] Bulletin of the Johns Hopkins Hospital, 1891, pp. 96 and 121.
[36] Quoted by Osler; Transactions of the Association of American Physicians, vol. xii., p. 385.
[37] Berliner Klinische Wochenschrift, 1894, p. 351.
[38] Johns Hopkins Hospital Reports, 1898, vol. v.
[39] Boston Medical and Surgical Journal, April, 1899, p. 353.

typhoid bacilli to be carried every now and then in small numbers to the kidney and then to be rapidly excreted into the urine, for how else are we to explain the frequent occurrence of the bacilli in this excretion?

The lung.—In other organs, too, the typhoid bacillus has been described not infrequently, for example, in the lung. Here the bacillus does undoubtedly occur, but not, I believe, as frequently as is sometimes imagined. Thus, in five cases in which I have examined the lung, in one only has the typhoid bacillus been present, this being a case of thrombosis of the pulmonary artery and infarction of the lung. In four others (two examples of lobar pneumonia, one of hypostatic pneumonia, and one of simple congestion), the typhoid bacilli were not found, though in two cases the bacillus coli was present in considerable numbers. The late Professor Kanthack also had a similar experience, since in four cases of broncho-pneumonia he was never once able to discover the specific organisms, though bacillus coli was present on more than one occasion.

In less suspected regions, too, as, for example, the testicle, the typhoid bacillus may be present even in the absence of any definite complication.

It will be seen, then, from what has been said that the bacilli are found in uncomplicated cases of typhoid fever with great constancy in the Peyer's patches, in the solitary follicles, in the mesenteric glands, in the spleen, and with great frequency in the red marrow of the bones and in the bile, not uncommonly in the kidney, and sometimes in the lung. In other organs, too, such, for example, as the testicle, their presence has been discovered. The relative frequency of their occurrence in these situations is shown in the following table from the St. Bartholomew's Hospital post-mortem records, the observations having been made by the late Professor Kanthack, by Dr. Andrewes, and by myself.

TABLE II.—*Showing the Relative Frequency of Occurrence of the Typhoid Bacillus in the Various Organs of the Body.*

—	Number of times examined.	Typhoid bacilli found.
Spleen	21	20
Mesenteric gland	13	12
Liver	4	3
Bile	10	9
Bone marrow	6	4
Kidney	8	2
Blood from the heart	10	2
Lung	9	1
Thyroid	1	0

It is evident, from a consideration of this table, that the bacilli are always widely distributed in the body and there would seem to be only one means by which such a wide distribution could be effected, and that is through the blood. Are, however, the bacilli found in the blood?

THE BLOOD.

In answering this question it will be well to consider first of all the results which have been obtained from an examination of the blood in fatal cases. In such cases, though it is not by any means the rule to find the typhoid bacillus in the blood after death, yet it occurs there by no means infrequently. Thus Vincent[40] found the bacillus in one case out of four and Flexner[41] in two cases out of six. Klein[42] recorded their presence in two out of four cases, a similar result also being obtained by Wright and Stokes. Lately I have examined the blood after death on nine occasions, and three other cases are recorded in our records at St. Bartholomew's Hospital. Of these 12 cases two gave a positive result, the typhoid bacilli being demonstrated in the blood with ease. Of the remaining 10 cases, five were sterile, three contained bacillus coli and bacillus proteus vulgaris, and two the pyogenic cocci. Table III. shows these results more exactly.

[40] Annales de l'Institut Pasteur, 1893.
[41] Loc. cit., vide note 38.
[42] Report of the Medical Officer of the Local Government Board, 1892-93

TABLE III.—*Showing the results of Post-mortem Examination of the Blood in Fatal Cases of Typhoid Fever.*

Total number of cases examined, 12.

Sterile	5	Streptococci, and staphylococci	1
Typhoid bacilli	2	Bacillus coli	2
Streptococci	1	Bacillus coli and proteus	1

It is interesting to note in passing that one of the cases in which the typhoid bacilli were found in the blood was that of a girl who died on the fourteenth day from the "severity of the disease" and "heart failure." It is possible that not a few of the cases which die thus early may really prove to be cases of similar marked typhoid septicæmia.

It will be seen, then, that out of a total of 30 cases in which the blood was examined after death the typhoid bacillus was found in nine of them. Evidently, then, in *fatal* cases it is not uncommon for the typhoid bacilli to be present in the blood in considerable numbers. But does the same occur in *non-fatal* cases during life, and is it easy to demonstrate the presence of the bacilli in the circulating blood? It may be said at once that it is a matter of extreme difficulty; indeed, it was held until quite recently to be almost impossible. Seitz[43] failed in seven cases, Janowski[44] in 27, Lucatello[45] in nine, Klein[46] in 10, and Fraenkel and Simmonds[47] in six. Occasionally, however, a positive result has been recorded; thus Thiemich[48] was once successful out of seven cases, Wiltschur (quoted by Janowski) once in 31, and Ettlinger twice out of 10 cases. Lastly, Stern[49] recently reports two successes and Block[50] one. In all seven successful cases are here mentioned against 110 failures. As a matter of fact, however, these results are misleading, for Kühnau[51] has lately shown that if much larger quantities of blood be taken than was used by the earlier observers—five to ten cubic centimetres, for example—and especially if the blood be immediately diluted after it has been obtained, to diminish its bactericidal power, then it is possible to obtain the bacillus from the blood during life in a very considerable percentage of cases. Working on these lines Kühnau was successful in 11 out of 41 cases. It should be noticed, however, that the number of colonies which developed were always extremely small, the total number varying from two to nine. If, then, when we examine only 10 cubic centimetres of blood we are able to demonstrate the bacillus in 25 per cent. of cases of typhoid fever, it is no rash assumption to believe that, were we able to examine the whole, we should always find it in the circulating blood during life. The reason why the bacilli are not found in greater numbers in the blood during life probably depends on the fact that in ordinary cases the blood is an extremely bad medium for their growth. Indeed, owing to its bactericidal power it is likely that such bacilli as do not succeed in finding shelter in some viscus are rapidly destroyed. This would not occur to the same extent in fatal cases (perforation and similar cases being excluded), for often it is owing to such patients acquiring this power that a fatal termination ensues, and on this fact doubtless in part depends the greater ease with which the bacilli can be demonstrated in the blood after death. We may believe, therefore, as indeed we should expect from the distribution of the bacillus in the body, that the micro-organisms pass into the blood in all cases of typhoid fever. They are, however, rapidly eliminated from it into the various organs or destroyed. In rarer cases, on the contrary, probably always fatal, when the blood fails to acquire bactericidal properties, the typhoid bacilli may develop therein and be found after death in considerable numbers.

THE TYPHOID ERUPTION.

The general distribution of the typhoid bacillus in the organs of a patient suffering from typhoid fever has now been considered, and it is obvious from the facts brought forward that typhoid fever is far from being merely an intestinal disease. Bearing this in mind it will be interesting to consider the relation of the bacilli to the "spots"—the roseolous eruption characteristic of the illness.

[43] Jahresbericht über Pathologische Micro-organismen, 1886, p. 165.
[44] Centralblatt für Bakteriologie, 1889, p. 657.
[45] Jahresbericht über Pathologische Micro-organismen, 1886, p. 176.
[46] Loc. cit., vide note 42.
[47] Centralblatt für Klinische Medicin, 1885, p. 737.
[48] Jahresbericht über Pathologische Micro-organismen, 1894, p. 266.
[49] Centralblatt für Innere Medicin, 1896, p. 1249.
[50] Bulletin of the Johns Hopkins Hospital, 1897, p. 119.
[51] Zeitschrift für Hygiene xxv., 1897.

The early observers for the most part were unable to demonstrate the presence of the bacilli in this lesion. Thus Wiltschur,[52] Seitz,[53] Curschmann,[54] Merkel and Goldschmidt,[55] and others in their numerous experiments all obtained negative results, while Rutimeyer[56] obtained one positive result in six observations. In the light of these results the statement of Neuhaus,[57] made as long ago as 1886, that he had obtained nine positive results in 15 cases, was generally received with incredulity. It may be said, therefore, that until quite recently the received opinion was that the spots in typhoid fever were not due to a local growth of the typhoid bacilli, but were more probably due to the absorption of the typhoid toxines into the general circulation.

Observers, however, were not entirely satisfied and continued working at the subject. In 1895 Thiemich[58] reported that he had found the bacilli in the spots in three cases out of seven, while early in 1899 appeared the important paper by Neufeld,[59] which apparently explained the discrepancies between the results of various observers. Neufeld argued that if the bacilli really were the cause, it was evident they were only able to obtain their foothold in the skin and subcutaneous tissue for a very short time, otherwise the spots themselves would not be so fleeing—hence to find them spots should be examined quite early in their development. Secondly, to eliminate as far as possible the bactericidal power of the blood itself, which would come in contact with the bacilli as soon as the spot was opened, he advocated the use of liquid culture media (broth) in order to dilute the blood and so diminish this source of error. The value of these suggestions was shown by his results. He examined the spots in 14 cases and in 13 he obtained a positive result. His methods of testing the bacilli obtained were, it may be stated, admirable. These results were confirmed in November of last year by Curschmann[60] of Leipzig. Following Neufeld's methods he examined the spots in 20 cases and in 14 he was able to demonstrate the typhoid bacilli, certain of his negative results also being evidently due to his having in some cases chosen spots already beginning to fade. Lastly, within the last few weeks, Richardson[61] of Boston, an extremely careful observer, reports similar successful results, the bacilli being isolated from the spots on an average six days *before* the Widal reaction was obtained. It should be added, however, that the number of typhoid bacilli in each individual spot must be very small, for though many observers have endeavoured to demonstrate them microscopically therein, they have never yet succeeded (Ernst[62] and Neufeld[63]). There would seem, then, to be hardly any doubt whatever that the rose spots are truly specific in nature and are the result of the direct presence of the typhoid bacillus.

THE EXCRETIONS.

Having now discussed the usual distribution of the specific microbe in the various organs in an uncomplicated case of typhoid fever we may turn our attention to the excretions, for it is of great importance to know how far each of these is infectious. There are four which have been so described with more or less frequency—the sweat, the expectoration, the fæces, and the urine.

The sweat.—With regard first of all to the sweat. There would seem to be *a priori* no reason why typhoid bacilli should not be found therein, since there is no doubt that the bacillus always passes into the blood. At present, however, there is really no evidence to show that they do occur in this excretion. Three positive observations have, it is true, been recorded in addition to numerous negative ones, but the observers, Geisler[64] and Sudakoff,[65] seem to have taken no special care to prove the identity of the micro-organism found, and for the present, therefore, their results may be disregarded.

The expectoration.—With regard to the expectoration the case is somewhat different. I have shown that the typhoid bacillus may be present in the lung in large numbers, and whenever this occurs we must believe that the sputum will always contain the micro-organism. Fortunately, however, these cases are rare, but nevertheless we should always look upon the expectoration in a case of typhoid fever, if there be any, as a possible means of spreading the disease and should take measures accordingly.

The fæces.—The idea that the fæces were the chief means whereby the disease was conveyed seems to have been first explicitly stated by Canstatt in 1847, and in this country Dr. William Budd long and ably maintained this view.[66] Indeed, it is probably due to his enthusiastic teaching that the doctrine of the intensely contagious character of typhoid stools throughout the whole course of the disease has held its ground ever since. Lately, however, a distinction has been drawn between the alvine dejections and the urine, and though it is absolutely certain that excremental pollution in its broad sense is the great cause of the spread of typhoid fever, it is at the present moment still debated how great is the share taken by the fæces and the urine respectively, and at what period of the disease each should be regarded as most dangerous. In the early days of bacteriology no difficulty was experienced in isolating the typhoid bacilli from the stools. It was open to anyone to effect this. The rapid progress of knowledge, however, soon showed that these were not typhoid bacilli, but merely bacillus coli communis or one of its numerous varieties, and it was then recognised that so far from being easy it was a matter of most extraordinary difficulty to find the true bacilli in the fæces. Thus Walthelet[67] in 1895 could only isolate the micro-organism in four stools, though he examined as many as 51. In 1896, however, the introduction of Elsner's medium somewhat facilitated matters and led at all events to renewed investigations. As a result we may say that there can be now no reasonable doubt that in the first and second weeks of typhoid fever the stools are highly infectious. The numerous

TABLE IV.—*Observations made on Typhoid Stools (obtained separate from urine) for the most part in the Later Stages of the Disease.*

No.	Age and sex.	Day of disease.	Character of stool.	Result.*
1	24, F.	8th, 11th, 15th (attack)	Semi-solid	—
			,,	+
			,,	—
		Convalescent, 20 days	Solid	—
2	16, M.	13th, 17th, 25th, 32nd (attack)	Semi-solid	—
			Solid	+
			,,	—
			Semi-solid	—
		T. N., 5 days	Solid	—
		? 1st day of a relapse	,,	—
		Convalescent, 6 days	Semi-solid	—
3	22, M.	9th, 14th, 18th, 21st (attack)	Peasoupy	—
			,,	+
			—	—
			Semi-solid	—
		T. N., 4 days	,,	+
		1st day of relapse	Solid	—
		5th ,, ,,	,,	—
		9th ,, ,,	,,	—
		Convalescent, 3 days	,,	—
		Convalescent, 10 days	,,	—
4	9, M.	19th day, 25th day (attack)	Peasoupy	—
			,,	—
		Convalescent, 13 days	Formed	—
5	42, M.	2 days before end of long relapse	Semi-solid	—
		Convalescent, 11 days	Solid	—
6	18, M.	Convalescent, 4 days	Semi-solid	—
7	21, M.	28th day	,,	—

* + signifies a positive result, typhoid bacilli being found in the stools. − signifies a negative result, typhoid bacilli not being found. T. N. = Temperature normal.

For further details consult THE LANCET, May 20th, 1899, p. 1346.

[52] Quoted by Janowski. Loc. cit., vide note 44.
[53] Loc. cit., vide note 43.
[54] Der Unterleibstyphus, Wien, 1898.
[55] Centralblatt für Klinische Medicin, 1887, p. 392.
[56] Ibid., p. 145.
[57] Berliner Klinische Wochenschrift, No. 6 and No. 24, 1886.
[58] Deutsche Medicinische Wochenschrift, 1895, No. 34, p. 550.
[59] Zeitschrift für Hygiene, 1899, Band xxx., p. 496.
[60] Münchener Medicinische Wochenschrift, Nov. 28th, 1899.
[61] Journal of the Boston Society of the Medical Sciences, Jan. 16th, 1900, p. 110.
[62] Ziegler: Beiträge zur Pathologischen Anatomie, viii., 1890, p. 195.
[63] Loc. cit., vide note 59.
[64] Centralblatt für Bakteriologie, vol. xiii., 1893, p. 767.
[65] Ibid., vol. xxv., 1899, p. 575.
[66] For an interesting, if somewhat highly-coloured, description of the dangers resulting from the stools reference should be made to Dr. Budd's work on "Typhoid Fever," London, 1873, p. 52.
[67] Annales de l'Institut Pasteur, 1896, p. 252.

observations of Pollak,[68] Jemma,[69] and Richardson[70] show that the typhoid bacilli can be found in them in practically every case at this period of the disease. An extremely important point, it may be remarked in passing, for it completely annihilates the fanciful but well-known theory of Sanarelli that typhoid fever is primarily a septicæmia and that the intestinal lesions are merely secondary. At later periods of the disease, however, and also during convalescence, if care be taken to obtain fæces uncontaminated with urine, it is extremely difficult to isolate the micro-organism. Thus Jemma,[71] Richardson,[72] and Lazarus[73] all found great difficulty at this stage, and my own observations bear out their results. Thus out of 20 observations made during the later periods of the disease, sloughs being actually present in the stools in some instances, in one only was a positive result obtained, and in this case a relapse very shortly followed; though in the three cases in which the examinations were made before the seventeenth day in each the typhoid bacilli were demonstrated at the second attempt.

It would be wrong, of course, to assume that because the micro-organisms cannot be demonstrated by our imperfect technique after the beginning of the third week that therefore they are not present. We have seen, indeed, that the gall-bladder may contain a pure culture of typhoid bacilli at the patient's death late on in the disease, and as a matter of fact this condition may continue for weeks, months, and even years after the primary attack. Whilst this lasts we must assume that the specific germ is carried with the bile into the alimentary canal, and we might therefore expect to find it in the fæces. It is possible, however, that if present only in small numbers the typhoid bacilli may be rapidly destroyed as soon as they come in contact with the other micro-organisms in the alimentary canal, for the toxines of not a few of them are extremely inimical towards the typhoid bacillus. This, however, though possible, has not yet been actually proved, and at present the following are the facts of which we are in actual possession. The specific micro-organism can be demonstrated in the stools if care be taken during the first and second and early part of the third week of the disease and possibly during the early part of the relapse. Later it cannot be demonstrated by our present methods. It follows, therefore, that the fæces are highly infectious at the commencement of the disease and that later they become much less dangerous. How soon they become absolutely innocuous cannot be stated, but we must be prepared for the possibility of their remaining in some cases a source of danger for long periods after the patient is apparently well—as long, that is to say, as the bile continues to harbour the parasite. It is quite possible, indeed, that certain epidemics in which the sanitary conditions were at fault and in which no obvious case of typhoid fever had been previously imported may have been caused by cases of this kind—epidemics which must always have a high interest for us, since it was from a consideration of them that Murchison was led to formulate his belief that in some cases at least typhoid fever could originate *de novo* and which prompted him therefore to name the disease "pythogenic fever."

The urine.—Passing now from the stools to the urine, the other great secretion by means of which typhoid fever is spread—or, as I believe myself, the chief means—I will only say now that, unlike the fæces, the urine only becomes dangerous in one out of every four cases of the disease and that as a rule it is towards the end of the disease or during convalescence that this condition occurs. In one other point, too, we notice a contrast and that is that while it is always difficult to find the typhoid bacilli in the stools in the urine it is always easy, for when they occur they are nearly always in pure culture and not uncommonly they are present in such extraordinary numbers that one cubic centimetre may contain as many as 500,000,000 micro-organisms. The danger of such a constant supply needs no comment, though incidentally it shows that our means of protection against the invasion of the typhoid bacillus are much greater than is generally supposed.

CONCLUSION.

If, now, we consider the facts which have been brought forward in connexion with the bacteriology of an ordinary case of typhoid fever we obtain the following data. The typhoid bacillus can always be found in the stools in the early periods of the disease. It can also be demonstrated always in the Peyer's patches and the mesenteric glands. It does not, however, remain limited to these situations but very soon and in all cases passes into the blood (from which it can be very often isolated) and by means of which it is distributed to the most diverse organs. Thus it can be always found in the spleen and in the liver. It gives rise in the skin to the typical eruption. It is in most cases present in the marrow of the bone and in the bile. It is frequently present in the urine, and is not uncommonly found in the kidneys. Occasionally, also, it may be detected in the lungs and sometimes in other organs.

And now we may ask, How do these facts bear upon our conception of typhoid fever? The answer is clear. Any conception of the disease which regards it merely as affecting the alimentary canal only can no longer be maintained. On the contrary, so far from considering it as an intestinal disease pure and simple, we should rather look upon it as a *modified form of septicæmia*. It is septicæmia in that always and in all cases the bacilli pass into the blood and then into the various organs, and in that the symptoms, excepting as far as they are intestinal, are referable to the poisons there produced. It is a modified form, however, in that in nearly all cases there is a definite local and primary disease whence the secondary dissemination of the micro-organism takes place.

Looked at in this way we have a ready explanation of the fact that the severity of the disease bears no relation to the number and character of the intestinal lesions. For just as a fatal septicæmia may originate in a scratch, so one or two small typhoid ulcers may be quite sufficient to allow the entry of the micro-organism and the development of the disease.

[68] Centralblatt für Innere Medicin, 1896, p. 785.
[69] Münchener Medicinische Wochenschrift, 1897, No. 33.
[70] Boston Medical and Surgical Journal, 1897, p. 443; Brit. Med. Jour., Dec 25th, 1897.
[71] Loc. cit., vide note 69. [72] Loc. cit., vide note 70.
[73] Berliner Klinische Wochenschrift, Dec. 9th, 1895, p. 1068.

Three Lectures
ON
THE SURGERY OF THE STOMACH.

Delivered in the Theatre of the Royal College of Surgeons of England on March 5th, 7th, and 9th, 1900,

BY A MAYO ROBSON, F.R.C.S. ENG.,
MEMBER OF THE COUNCIL AND HUNTERIAN PROFESSOR OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND; EMERITUS PROFESSOR OF SURGERY IN THE YORKSHIRE COLLEGE; AND SENIOR SURGEON TO THE LEEDS GENERAL INFIRMARY.

LECTURE III.[1]

Delivered on March 9th.

DILATATION FROM ATONY DUE TO VARIOUS GENERAL AND LOCAL CAUSES, AND PERSISTING AFTER THE ORIGINAL CAUSE HAS DISAPPEARED.

MR. VICE-PRESIDENT AND GENTLEMEN,—There are certain cases of dilated stomach of the atonic variety in which the chief symptoms depend on the great bulk of the organ. As descriptive of the amount of paralytic distension that is possible Bamberger mentions an extreme case in which the stomach held 70 pints of fluid.[2] As these cases may be dependent on chronic catarrh or on some general cause not mechanical it is not necessary that I should enter fully into the etiology or even into the treatment, for general and medical treatment if carried out systematically and for a sufficient length of time usually yields good results; but in some cases, despite regular lavage of the dilated organ, well-regulated diet, and general medical treatment, the dilatation persists and the nutrition of the patient and the general health become seriously impaired; in such cases the operation of gastrorrhaphy or gastroplication may be worth considering.

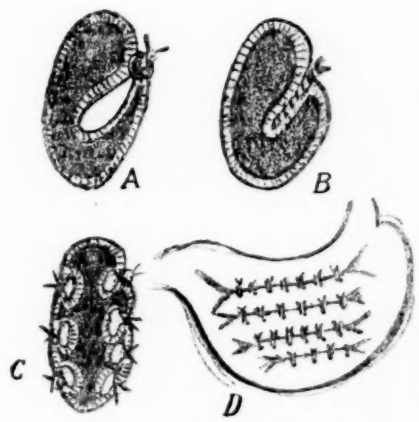
Bircher performed the operation and reported three cases in 1890 and Weir of New York published a paper on this subject in 1892. The reports show that the operation is a most beneficial one if the cases be well selected, but before performing gastroplication it should be clearly ascertained that there is no mechanical obstruction either at the pyloric orifice or in the duodenum, for in the report of a recent case

[1] Lectures I. and II. were published in THE LANCET of March 10th and 17th, 1900, respectively.
[2] Gould and Pyke, p. 630.

I noticed that gastrorrhaphy had been done where the pyloric orifice was markedly stenosed. Needless to say in such a case it could do no permanent good.

The following diagrams illustrate the method of folding

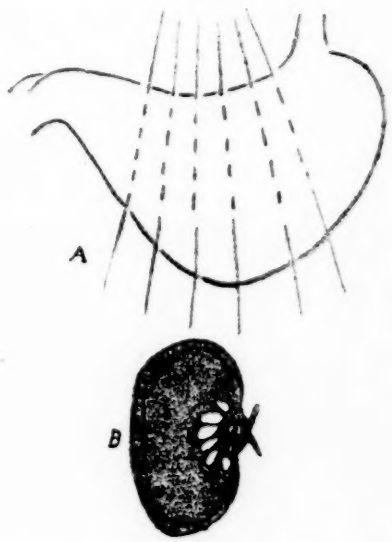
FIG. 5.



Different methods of gastroplication. A, Bircher's method seen in section. B, Weir's method seen in section. C, Brandt's method seen in section. D, Brandt's method seen anteriorly.

and diminishing the volume of the stomach adopted by various operators. In slighter cases probably Bircher's operation would do all that is required, but in the more severe cases a modification of Mr. W. H. Bennett's method would probably be the more efficient (Figs. 5 and 6). The

FIG. 6.



Gastroplication. Bennett's method modified by Moynihan. A, Seen anteriorly. B, A sectional diagram.

operation is neither difficult nor attended with serious risk since there is no danger of sepsis as the cavity of the stomach is not opened; and as the stomach can be drawn out of the wound to be sutured the general peritoneal cavity is saved from long exposure.

The following table, which Mr. Willmott Evans has assisted me in compiling, I believe includes all the reported cases, 28 in number, with a 7·1 per cent. mortality.

TABLE XVIII.—*Statistics of Gastroplication (Gastrorraphy).*

Name of surgeon operating or collecting cases.	No. of cases.	Recovered.	Died.	Remarks.
1. Bircher.	1	1	—	The patient died a month later after pylorectomy.
2. ,,	1	1	—	The patient was well three years later.
3. ,,	1	1	—	,,
4. ,,	1	1	—	The patient was well two and a half years later.
5. ,,	1	1	—	Later pyloroplasty was performed.
6. ,,	1	—	1	The patient recovered from the operation but died two weeks later from syncope.
7. ,,	1	1	—	The patient was well a year later.
8. ,,	1	1	—	The patient was well two months later.
9. ,,	1	—	1	—
10. Brandt.	1	1	—	—
11. Stockman.	1	1	—	—
12. Bennett.	1	1	—	—
13. Moynihan.	1	1	—	The patient was well in 1899.
14. Weir.	1	1	—	—
15. Spencer.	1	1	—	Gastroplication and pyloroplasty were performed.
16. Shattuck.	1	1	—	—
17. Maylard.	1	1	—	—
18. Horrocks.	1	1	—	Stricture of pylorus noticed, but not treated.
19. Hill.	1	1	—	—
20. Faure, I. L.	1	1	—	—
21. Borellius.	1	1	—	—
22. Nicolaysen.	1	1	—	—
23. Roux.	1	1	—	—
24. Tricomi.	1	1	—	—
25. Caselli.	1	1	—	—
26. Oliva.	1	1	—	—
27. Hartmann.	1	1	—	The patient gained 15 kilos. in weight in three months.
28. Mayo Robson.	1	1	—	Gastroplication and gastrolysis were performed.
Total	28	26	2*	

* Equals a mortality of 7·1 per cent.

References.—1, 2, and 3. Correspondenzblatt für Schweizerische Aerzte, 1891. p. 713. 4, 5, 6, 7, 8, and 9. Ibid., 1894, p. 553. 10. Centralblatt für Chirurgie, 1894, p. 361. 11. Edinburgh Hospital Reports, vol. iv., 1896, p. 502. 12. THE LANCET, July 4th, 1896, p. 8. 13. Brit. Med. Jour., July 9th, 1892, p. 29. 14. New York Medical Journal, July 9th, 1892, p. 29. 15. Medical Press and Circular, 1892, vol. ii., p. 456. 16. Transactions of the American Surgical Association, 1897. 17. THE LANCET, April 8th, 1899, p. 862. 18. Annals of Surgery, September, 1899, p. 249. 19. Liverpool Medico-Chirurgical Journal, July, 1898, p. 221. 20. Gazette des Hôpitaux, 1897. 21 and 22. Mercredi Médical, Paris, Dec. 25th, 1896. 23. Revue de Gynécologie et Chirurgie, vol. i., p. 1. 24 and 25. Riforma Medica, Napoli, 1895, vol. iv., p. 375. 26. Ibid., May, 1898. 27. Terrier and Hartmann, Chirurgie de l'Estomac, 1899. 28. This case is reported here for the first time.

I have only seen one case that I thought suitable for gastroplication and as the operation was only performed in January of this year it is too early to speak of it except to say that the patient, aged 35 years, who had been invalided for 18 months and who had tried lavage and other medical treatment for several years without benefit, expresses himself as cured of all his former symptoms and he certainly looks well and seems able to take his food without any difficulty. I performed the operation after a modification of the plan carried out by Mr. Bennett

ACUTE DILATATION OF THE STOMACH.

Acute gastric distension was described by Dr. Fagge, his paper being illustrated by two cases, both in men, one 30 years of age and the other 20 years of age, and both ending fatally. The symptoms were those of largely distended stomach, coming on suddenly, accompanied by pain, diminished secretion of urine, and death. Many other cases of the kind have since been reported and the subject was fully discussed in an able paper by Dr. T. N. Kelynack[3] in the *Medical Chronicle*, where will be found a reference to all cases previously reported. Pepper and Stengel suggest that the immediate cause is spasm of the pylorus.

Carion and Hallion[4] have shown that the section of the pneumogastric nerves in the dog leads to dilatation of the stomach and to symptoms in many cases resembling those of uræmia. It seems probable that the symptoms are dependent on the absorption of toxins from the cavity of the stomach, just as in some cases the absorption from a dilated stomach leads to tetany. In a case of Sir William Broadbent's[5] eight pints of fluid were removed by the syphon. No sooner, however, was this removed than the stomach began to re-fill and rapidly regain its former dimensions. In the Leeds Infirmary we have had three cases of this kind, under the care of Mr. T. R. Jessop, Mr. W. H. Brown, and myself respectively, and they all terminated fatally.

Mr. Brown's case has been reported in THE LANCET.[6] In this case a man, aged 55 years, said to be suffering from intestinal obstruction, was admitted into the hospital. He was in his usual good health up to 48 hours previously, when suddenly he was seized with intense pain in the abdomen accompanied by incessant vomiting; the vomiting continued until three hours before admission. On admission the hands were cold, the pulse was small and thready, and the face was pinched and sunken. The abdomen was distended above the pubes, but flattened at the sides and epigastrium; it was resonant, except between the umbilicus and pubes, where it was dull. Fluctuation could be felt and a succussion splash was obtained. The temperature was subnormal. Earlier in the day the bowels had been moved slightly, but no urine had been passed since the onset of the illness—i.e., for 48 hours. The abdomen was not tender, but the patient was in great pain, turning from side to side constantly and asking for relief from his agony. A catheter was passed and about a drachm of bloody urine was withdrawn. An exploring syringe was passed into the fluctuating swelling midway between the umbilicus and pubes and withdrew about two drachms of thick greenish fluid with a curious smell recalling the contents of a pancreatic cyst. As the general aspect of the case presented unusual difficulties with regard to diagnosis, and as it seemed certain that the man would die shortly if unrelieved and that the pressure of the fluctuating tumour was the cause of his suffering, Mr. Brown decided to operate. Ether was given and the abdomen was rapidly opened over the most prominent part of the swelling. A tense, thin-walled, rounded cyst was found which contained a dark liquid with some gas. As no colon could be seen or felt, and as the tissues of the cyst wall seemed to be more like peritoneum than any viscus, Mr. Brown drew it to the surface, opened it, and let out about three pints of dark green viscid fluid closely resembling that of a pancreatic cyst. The walls were stitched to the skin and the wound was closed. The patient rallied from the operation and expressed himself as being relieved, but he died five hours later. At the necropsy the cyst was found to be a dilated stomach which would easily hold five pints; there was no pyloric obstruction. The kidneys showed marked signs of nephritis and were saccular; all the other organs were healthy.

Mr. Jessop reported his case before the Leeds and West Riding Medico-Chirurgical Society; it also ended fatally after gastrostomy.

My own case came on ten days after a duodeno-cholecdochotomy for the removal of a gall-stone impacted in the common duct; the patient was doing well in every respect until 24 hours before her death when she suddenly began to vomit, the abdomen became enormously distended, the urine became suppressed, and the patient died in a state of collapse. At the post-mortem examination, beyond dilatation of the stomach nothing was found to account for death. It is interesting that in this case there were adhesions of the pylorus to the liver and gall-bladder which we thought might probably have been the cause of the trouble. I was unfortunately out of town at the time of the catastrophe, otherwise I should certainly have operated, though probably the result might have been no different, and when my colleague who was taking charge for me was called in to see the patient she was pulseless and cyanosed.

Dr. Appel[7] has reported a case where acute dilatation of the stomach supervened on an abdominal injury. The abdomen was opened for what was supposed to be intestinal obstruction, but three-quarters of the abdominal cavity were occupied by a dilated stomach. The stomach was opened, giving vent to a quantity of gas and fluid, the incision being afterwards closed, but the second night after the operation the abdomen became distended as before and death rapidly ensued. At the necropsy nothing was found abnormal except the distended and dilated stomach. It was suspected that the great sympathetic abdominal ganglia might have been injured, but nothing was found wrong with them on examination. Fenger[8] reports a case of acute distension of the stomach five days after cholecystotomy. The stomach-tube was used giving temporary relief, but the patient died on the tenth day, that is, five days after supervention of the stomach symptoms. The necropsy showed nothing amiss except an enormously dilated stomach. Dr. Box and Mr. Wallace[9] report a case in a boy, 16 years of age, following on a blow on the epigastrium. Abdominal section disclosed a dilated stomach which was incised and emptied but in that case also death followed. Kirch[10] reports a case in a youth, 19 years of age, who made a supper of soup and beer which was followed by pain and uncontrollable vomiting. The stomach was washed out and five and a quarter pints of greyish-green fluid were evacuated. The next day another two and a half pints were removed by the stomach-tube, but the patient died in the evening from heart failure four and a half days after the beginning of his illness. At the post-mortem examination the stomach was found to have lost its normal shape and to have the form of a long dilated tube reaching from the left hypochondrium to the true pelvis and then turning sharply upwards to the duodenum.

A careful analysis of all the recorded cases of acute dilatation would seem to point to a neuro-paresis, probably associated with spasm of the pylorus, but so far surgery seems to have been of little avail in these cases and no treatment seems to have been of material service. Nevertheless we must not give up our efforts and I would suggest that in every case of this kind, no matter at what stage it may be recognised, unless the patient be actually dying, the abdomen should be opened and the stomach emptied and connected with the jejunum, thus providing for continuous drainage into the intestine. I believe that as yet this method has not been put to the test.

Although in the greater number of cases of stenosis of the pylorus requiring the surgical treatment a general anæsthetic may be given, it is well to bear in mind that if necessary, as in serious cases like those under consideration, the operation may be performed under local anæsthesia produced by Schleich's method. Herczel has reported two cases where he did gastro-enterostomy in this way, in both of which recovery was rapid. In another case which he did under a general anæsthetic pneumonia supervened and he believed that the anæsthetic played a prominent part in its production. Czerny has remarked that a certain number of patients submitted to stomach operations suffer from pneumonia owing to the predisposition caused by the cessation of abdominal respiration and the superficial character of the thoracic respiration on account of the pain in the wound caused by costal movement. I have on several occasions performed operation of the stomach successfully under cocaine where I thought the patient too feeble for general anæsthesia or where chest complications rendered chloroform or ether inadvisable and with very little pain, discomfort, or shock to the patient.

GASTRO-ENTEROSTOMY.

Gastro-enterostomy, or the establishment of a permanent fistula between the stomach and duodenum or jejunum, is

[3] Medical Chronicle, May, 1892.
[4] Semaine Médicale, August 21st, 1895.
[5] Referred to in Dr. Dreschfeld's article in Professor Clifford Allbutt's System of Medicine.
[6] THE LANCET, Oct. 14th, 1899, p. 1017.
[7] Philadelphia Medical Journal, August 12th, 1899.
[8] Clinical Review, Feb. 28th.
[9] THE LANCET, June 4th, 1898, p. 1538.
[10] Deutsche Medicinische Wochenschrift.

one of the most useful of the operations undertaken on the stomach, since there are fewer contra-indications to this procedure than in any other stomach operation, and it is applicable not only as a means of overcoming obstruction but also for giving physiological rest to the organ. It may be performed for simple or malignant stenosis of the pylorus, for chronic or acute dilatation, for intractable simple ulceration, and for bleeding ulcer, and it has been done for severe gastralgia and inveterate chronic dyspepsia not yielding to medical treatment. It was first performed by Wölfler on Sept. 27th, 1881, for cancer of the pylorus, by Rydygier and Mastryski for simple stenosis with dilatation, by Doyen for simple ulcer, and by Hartmann on Dec. 10th, 1895, for hæmatemesis due to bleeding ulcer.

As the various methods employed for gastro-enterostomy are given so fully in various text-books it is needless for me to enter into details which would occupy more time than is at my disposal. I have performed the operation successfully (1) by simple suture, (2) by the aid of Senn's plates, (3) by the use of my bone bobbin, and (4) by the employment of the Murphy button. Of these methods I have no hesitation in saying that I prefer the use of the bobbin. The operation where the button is used being by a few minutes quicker than when the bobbin is employed may be in some cases preferable, though there is a drawback to its employment in the fact of the button not infrequently falling into the stomach and remaining there. This has occurred in three of my own cases. In consequence of this accident and for other reasons Professor Kocher has given it up, and I hear that Dr. Murphy himself has also adopted Laplace's method of suturing in this operation. Laplace's operation is performed by means of an ingenious instrument which coapts the opposing surfaces that have to be united so that a continuous suture can be applied around the opening before the final stitch is inserted. I have seen the operation done by one of my colleagues but I have not as yet employed it. Its great disadvantage seems to be the absence of direct union between the two mucous margins and the small opening for anastomosis.

The junction with the stomach may be made either into the duodenum or upper part of the jejunum, the latter being, as a rule, preferred because it is easier and less likely to cause soiling of the peritoneum, since it is so readily clamped by an elastic ligature. The jejunum is easily found by pushing to the right or raising the omentum and passing the hand behind the transverse colon when the attached part of the jejunum is at once reached and a loop selected about a foot from the fixed point. The junction may be made either to the front or the back of the stomach. If to the latter a slit must be made in the transverse mesocolon and the junction made through that; if to the former the whole procedure can be effected outside the abdomen and with much less general exposure; hence I prefer to make the junction in front. There are, however, many different methods in vogue for making the anastomosis which may be classified as follows: 1. *Gastro-jejunostomy.*—(*a*) Anterior, in which the junction is made to the front of the stomach. (1) Pre-colic (Wölfler, 1881) in which the jejunum is brought over the colon, and (2) retro-colic (Brenner, 1892) in which the jejunum is made to pass through the transverse mesocolon and the great omentum before reaching the anterior surface of the stomach. (*b*) Posterior, in which the junction is made in the posterior wall through a slit in the transverse mesocolon (Von Hacker, 1885). (*c*) After pylorectomy by any of these methods. 2. *Gastro-duodenostomy.*—(*a*) With great dilatation of the stomach a junction may be easily effected between it and the second part of the duodenum (Jaboulay, 1892). (*b*) After pylorectomy (1) end-to-end suture; and (2) posterior anastomosis after closing the open end of the stomach and duodenum (Kocher).

Among the modifications are (*a*) Paul's proposal to incise all the tissues at the proposed junction except the mucous membrane and to apply chloride of zinc to these, so that within 24 or 48 hours after the operation the two hollow viscera will be made to communicate by the sloughs separating. (*b*) Postinkow (1892) and Podrez advise making the communication by means of two crossed ligatures tied tightly, which makes the anastomosis within three or four days. (*c*) Gaston (1884) employed in a similar way the elastic ligature on dogs and McGraw used it successfully on the human subject in 1890. (*d*) In order to avoid regurgitation Kocher adopted a valvular method of uniting the viscera. (*e*) For the same reason Chaput made use of an H-shaped opening. (*f*) Sonnenberg made a valve by invaginating the stomach into the intestine. (*g*) Braun joined together the two arms of the communicating loop of bowel so as to establish continuity of the intestinal canal without the contents passing the opening into the stomach. (*h*) Lauenstein made a communication with an adjoining loop of bowel for the same purpose. (*i*) Wölfler and Rouse modified these operations by completely dividing the bowel and implanting the cut ends into the stomach and bowel respectively. Practically there are two methods employed, Wölfler's anterior and Von Hacker's posterior operations. After pylorectomy Kocher's method is undoubtedly the best. A study of statistics would seem to show that it matters little which method is employed, and the surgeon will select that which seems to him to be the easiest to perform. For my own part I prefer Wölfler's operation.

The whole operation of gastro-enterostomy may be done in from 15 minutes to 30 minutes. All the precautions mentioned under pyloroplasty should be observed, so as to guard against shock. If the patient is too ill to bear general anæsthesia the operation may be done under cocaine supplemented by a whiff of chloroform and ether if required. The following points should be observed in anterior pre-colic gastro-enterostomy. 1. After finding the fixed part of the jejunum make the anastomosis from a foot to one and a half feet from it, so as to avoid strangling the colon and kinking the junction with the stomach. 2. Let the afferent part of the intestine be to the left and the efferent to the right. 3. Fix the intestine well beyond the point of junction so as to avoid a spur. 4. Silk of moderate thickness is the best suture. 5. Apply a pad of gauze behind the parts to be joined as well as around them, so as to avoid soiling the peritoneum. 6. In anterior gastro-enterostomy it is easy, if thought advisable, to bring a small loop of omentum around the line of junction and thus to make the operation safer.

After treatment.—Since the greater number of these cases do not come under the care of the surgeon until very late, it is advisable to carry out all the means of preventing and combating shock that have been described. As soon as fluid can be taken by the mouth a little may be given in repeated doses; for instance, a teaspoonful of champagne every quarter of an hour is often useful. Light feeding may be commenced on the second day, especially if the button has been used. If there be regurgitation into the stomach the bowels should be moved by enema if possible, and the patient should be raised in bed and the stomach washed out. If no relief should ensue the abdomen may be re-opened and an entero-anastomosis established, as has been done by Ricard and Czerny with success.

The ultimate results of gastro-enterostomy have engaged the attention of several observers. These are: (1) return of digestive functions, (2) disappearance of hyper-acidity in the ulcer, (3) relief of pain, (4) cessation of vomiting, (5) healing of ulcer, (6) arrest of hæmorrhage, (7) return of appetite, (8) increase in weight, (9) disappearance of inflammatory tumour, (10) lessening of malignant tumours, (11) new blood formation, (12) gradual lessening of the dilatation of the stomach, and (13) in cancer prolongation of life of from three to 15 months. Dr. Stendel gives the average prolongation of life after gastro-enterostomy as 12·6 months, some of the patients being alive four and a half, five, and five and a half years after operation, but as these were in all probability cases of simple character this cannot be accepted as altogether accurate, and the estimate of 7 to 8 months, when doubtful cases are removed from the malignant list, is much more likely to be correct. Considerable contraction evidently occurs in some cases after the use of the button (Stendel), and probably after every method a certain amount of diminution of the opening occurs in time.

In the compilation of the following statistics (see Table XIX.) and in the verification of the references I have had the kind and able assistance of Mr. Willmott Evans.

With regard to the method of operating—i.e., by the anterior or the posterior operation—Haberkant gives the percentage mortality at 44 for the anterior and 42 for the posterior operation, and von Hacker at 50 for the anterior and 36·8 for the posterior, but Mehler gives it at 47·9 for the anterior and 65·2 for the posterior. On averaging these percentages it works out as 47·3 for the anterior position and 48 for the posterior position, so that it would seem to make little difference whether Wölfler's or von Hacker's method be employed. It will be noticed that the number of cases collected (1978) is large and that the mortality varies from 0 per cent. to 100 per cent., but that on grouping all the cases together the average mortality is 36·4 per cent. The

results vary very considerably according to the nature of the case for which operation has been undertaken, as also in the earlier and later series of cases. Haberkant gives two periods of seven years each. In the first period the mortality was 55·9 per cent. and in the second period it was 39·3 per cent. Petersen (Czerny's Clinic) also gives two periods in simple cases, in which before 1895 the mortality was 25 per cent. and since 1895 it was 3 per cent. Chlumskiji gives three periods. From 1881 to 1885 the mortality was 65·7 per cent.; from 1886 to 1890 it was 46·47 per cent.; and from 1891 to 1896 it was 33·91 per cent.

As to the nature of the case Stendel (Czerny's Clinic) gives the mortality in gastro-enterostomy for cancer as 34·5 per cent. and in gastro-enterostomy for simple disease as 14·3 per cent.; and Haberkant gives the mortality in gastro-enterostomy for cancer as 43·5 per cent. and in gastro-enterostomy for ulcer as 25·5 per cent.

TABLE XIX.—*Statistics of Gastro-enterostomy.*

	Source of report of cases.	No. of cases.	Recovered.	Died.	Mortality per cent.
1.	Mikulicz.	26	19	7	27·0
2.	Czerny.	90	61	29	32·0
3.	Doyen.	21	16	5	23·8
4.	D'Ewald, von Lindner, von Bergmann, and von Sonnenberg.	26	10	16	62·0
5.	Carle.	45	36	9	24·5
6.	Stendel (Czerny's Clinic).	110	77	33	30·0
7.	Mayo Robson (private).	8	6	2	25·0
8.	Leeds Infirmary.	35	20	15	42·86
9.	Chlumskiji, 1881–85.	35	12	23	67·7
10.	,, 1886-90.	114	61	53	46·47
11.	,, 1891-96.	401	265	136	33·91
12.	Vaseoncello.	4	3	1	25·0
13.	Gallet.	3	2	1	33·3
14.	Desfosses.	93	64	29	31·1
15.	Weir.	5	5	0	0
16.	Barker.	8		2	33·3
17.	Berg.	17	17	0	0
18.	Boas.	3	3	0	0
19.	Sholita.	2	2	0	0
20.	Davis.	3	3	0	0
21.	Single cases collected by Mr. Willmott Evans.	27	21	6	22·2
22.	Certain London Hospitals.	32	9	23	71·8
23.	Wilheur.	219	103	116	53·3
24.	Haberkant: ,, First seven years. ,, Second seven years.	298	171	127	42·6 55·9 39·3
25.	Roux.	31	28	3	9·6
26.	Tuffier.	50	48	2	4·0
27.	Lambotte.	6	6	0	0
28.	Van Kleef.	68	54	14	20·59
29.	Fricle.	2	1	1	50·0
30.	Chaput.	2	1	1	50·0
31.	,,	2	2	0	0
32.	Monprofit.	19	17	2	10·5
33.	H. Pehan.	67	33	34	50·7
34.	Kappeler.	8	3	5	62·5
35.	—	10	7	3	30·0
36.	—	21	17	4	19·0
37.	Garre.	20	13	7	35·0
38.	Carle and Pantine.	19	15	4	21·0
39.	—	25	20	5	20·0
40.	—	1	0	1	100·0
1.	—	1	1	0	0
42.	—	1	0	1	100·0
	Total	1978	1258	720	= 36·4

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TETANY AND TETANOID SPASMS IN ASSOCIATION WITH GASTRIC DILATATION.

It does not appear to have been generally noticed that severe muscular spasms of a tetanoid character, in rare cases amounting to severe or even fatal tetany, are frequently associated with dilatation of the stomach, yet I have noticed tetanoid symptoms in so many cases of dilated stomach that I have come to look at it as a frequent concomitant of the disease.

An important paper on the subject by my colleague Dr. E. F. Trevelyan published in THE LANCET[11] shows very forcibly that fully developed tetany associated with stomach dilatation is a symptom of extreme gravity and that in such cases a fatal termination is to be feared in a considerable percentage of cases. To quote from Dr. Trevelyan's paper: "If the term 'gastric tetany' is allowed to include the milder as well as the severer cases—and there is no sufficient reason against this view—then the disease may turn out to be more common than is usually supposed. The transition between gastric tetany strictly so-called, tetany with gastro-intestinal symptoms, and ordinary tetany would seem to be a gradual one. The prognosis of tetany occurring in gastric dilatation is undoubtedly very serious; nearly 75 per cent. of the cases die. The largest mortality occurs in [cases] where the spasm in the extremities is associated with tonic spasm in the head and trunk muscles or with clonic spasm. If the very strict views are held as to the disease then the outlook is almost hopeless; thus of the 11 cases recognised by Frankl Hochwart only one recovered. There is a danger here, as in some other diseases, that the fatal issue is raised to be the chief criterion as to the nature of the affection." My own experience of tetany and of the severe muscular spasms in association with gastric dilatation leads me to think that we may possibly take a more hopeful view if the cases be treated surgically at an early period. The following cases will serve to illustrate my views. In the first case the tetany was so pronounced that the question of strychnine poisoning crossed my mind. In the second and third cases, though there were well-marked tetanic spasms, the cramps were limited to the extremities and the abdomen.

CASE 1.—A man, aged 34 years, was sent to me by his medical attendant in January, 1895, with a view to having something done in the Leeds Infirmary to relieve his condition. He had been suffering for five years from pain after the ingestion of food, with attacks of vomiting. Latterly his condition had become aggravated, the pains occurring from half an hour to one hour after each meal and being relieved only by vomiting, so that for the last six months he had had to give up his work as a printer. For some time before coming under my notice there had been very evident peristalsis from left to right in the epigastric region. Throughout the period over which his stomach symptoms extended his bowels had for the most part been very constipated, but there were occasional attacks of diarrhœa. During this time he had attacks of what he described as "cramps" in his limbs and especially in his legs. He had lost very considerably in weight, as in December, 1892, he weighed 9 st. 6 lb., whereas in January, 1895, his weight was only 7 st. 7½ lb. On examination there was found well-marked dilatation of the stomach, but the feature of the case which presented most interest in connexion with the present question was the occurrence while under observation of severe tetanic spasms, affecting almost all the muscles of the body. So extreme were these and so widespread—the muscles of the trunk and of the cervical region as well as those of the limbs being affected—that on Jan. 17th

[11] THE LANCET, Sept. 24th, 1898, p. 791.

the question of possible poisoning from strychnine was raised. As palliative treatment of the stomach condition gave no relief the stomach was exposed on Jan. 24th and the diagnosis of cicatricial stenosis with hypertrophy of the pylorus was confirmed. Pyloroplasty was done, a bone bobbin being employed to ensure patency of the new pylorus. Recovery was uninterrupted, and although the cramps were present up to the time of operation he never had even a threatening of cramp afterwards. On Feb. 15th he was able to take a mutton chop for his dinner without inconvenience, and by March 2nd (five weeks after the operation) he had gained eight and a half pounds. Since then he has done very well, and two years after the operation he had quite recovered his strength and was working as usual, his weight then being just over what it was in December, 1892, and quite two stones above what it was at the time of the operation. There has been no recurrence of any "cramps" or of muscular spasms of any kind. In a letter I received at the beginning of 1899 he speaks of some slight symptoms which may have had their origin in some stomach disorder, but he adds, "You will please understand that I am a new man to what I was when you saw me last."

CASE 2.—A man, aged 24 years, was seen by me on Oct. 5th, 1897, in consultation with his private medical attendant, on account of severe painful cramps of the extremities and of the abdomen, with persistent vomiting. He gave the history of having had pain after food for several years previously and of having vomited blood, since which time he had never been well and had gradually lost flesh. For some little time before I saw him he had vomited every day unless the stomach was washed out; and from weighing over 10 st. he had diminished to a little over 8 st. There was well-marked dilatation of the stomach, but no pyloric tumour could be felt, and simple stricture of the pylorus was diagnosed. He was admitted to the infirmary some time in October, and on the 21st I performed pyloroplasty as the pyloric orifice would only permit the passage of a No. 10 catheter. The longitudinal incision in the pylorus was sutured vertically over one of my bone bobbins. Recovery was uninterrupted and from that time the cramps and vomiting ceased. He returned home within a month. On Oct. 23rd, 1898, I received the following letter from him: "It is with a grateful heart I write to thank you for the good received at your hands 12 months ago. I am thankful to say I have never had any trouble with my stomach since. I feel it my duty to acknowledge the good I received and also to thank you for your extreme kindness."

CASE 3.—A woman, aged 29 years, was sent to me from the east coast in the spring of 1895 suffering from severe pain in the abdomen associated with vomiting and loss of flesh; there was well-marked dilatation of the stomach and the pain always started on the left of the abdomen and passed to the right, on which side, just below the ninth rib, there was well-marked tenderness with rigidity of the right rectus muscle. Operation was declined and I did not see the patient until nearly the end of the year when she told me that the pain in the abdomen was excruciating and recurred every day. She said it was associated with severe cramp in the limbs, especially in the legs and thighs, and that at night she was kept awake by the pain. Vomiting of large quantities occurred daily and she was steadily losing weight and strength. Her symptoms began in 1888 and she had lost two stones in weight between that year and 1895. On Dec. 14th I opened the abdomen and found active ulceration of the pylorus which was adherent to the gall-bladder, liver, and abdominal walls, and was so much thickened as to form a distinct tumour. Pyloroplasty was performed after the adhesions had been separated. Recovery was uneventful and satisfactory in every way and she returned home within the month. She never had any return of the tetanic symptoms and a report sent to me in March was to the effect that she had gained flesh and was "well." In July, 1896, I saw her again for stomach symptoms but without much loss of flesh. In 1897 and 1898 the vomiting, the loss of flesh, and well-marked stomach splash showed that the pyloric trouble had recurred, and as I found a distinct tumour of the pylorus, which I believed to be simple inflammatory induration, I performed gastro-enterostomy in October, 1898. She made a good recovery and has been well since. A letter in December, 1899, states that she is quite well and has fully regained her weight. The interesting point in this case is that there was no return of the painful cramps in the limbs after the first operation.

Though tetany occurs apart from gastric dilatation—for instance, in children during teething, when it is frequently associated with gastro-intestinal disorders and not infrequently merges into general convulsions—and in other conditions apart from stomach disorders, yet tetany or painful muscular spasms of a serious character are so frequently associated with gastric dilatation that one cannot ignore the association and pronounce it merely accidental. It is curious that I have never seen the symptoms in other than dilatation due to simple causes, such as adhesions of the pylorus to the gall-bladder or liver, or stricture of the pylorus due to the cicatrisation of ulcers. I have never seen it in simple unobstructive dilatation or in dilatation due to cancer of the pylorus, though Dr. E. F. Trevelyan gives single examples of its association with both in his paper.

The immediate cause of tetany is perhaps beyond the scope of a surgical lecture, but as my views are based on clinical experience they may be worth relating. I have noticed that the exacerbations of the tetanic state (especially in the first case I have related) were always associated with a painful contraction of the stomach, and that when the wave of contraction had reached the pylorus the latter, which was previously incapable of being felt, formed a distinct hard tumour. The abdominal pain then became very intense and the tetanic cramps in other muscles came on, or if already present became intensified. From this sequence of events I have come to the conclusion that the cause of tetany is a double one: first, the absorption of some poison from the dilated stomach which increases the excitability of the nervous system; and secondly, a reflex effect produced by the painful contraction of the pylorus. The practical outcome of these observations is that where tetany or allied conditions are associated with gastric dilatation surgical treatment is well worth considering before the symptoms become so severe as to lead to the almost hopeless condition described in the report of some of the fatal cases.

INJURY OF THE STOMACH.

The stomach is so well protected by the chest wall and the surrounding organs that it is seldom ruptured from blunt force applied to the abdominal wall, though contusions and partial or complete rupture may occur from a blow or kick in the epigastric region when the stomach is full. The vomiting of blood, therefore, with pain over the stomach immediately following a blow may demand exploration. It would be wise, however, before resorting to operation to inflate the stomach, as if a rupture has taken place gas will escape into the peritoneal cavity and the liver dulness will disappear, whereas if the organ be unruptured the distended stomach will be clearly outlined through the abdominal wall. In case of doubt a small incision in the middle line above the umbilicus will speedily settle the question, for if the stomach is ruptured there will be an escape of odourless gas immediately the peritoneum is opened and in all probability blood-stained fluid from the stomach contents would also escape. Needless to say, in case of rupture no time should be lost in first arresting hæmorrhage and then closing the laceration and cleansing the peritoneum.

Gunshot and stab wounds of the stomach are not infrequent and there are now numbers of cases on record where the stomach has been perforated by a bullet and recovery has occurred. It must not be forgotten that if there is one wound of entry into the stomach there will probably be one of exit. In one reported case there were no less than three wounds in the stomach, two of which were sutured and the third, being undiscovered, led to death from peritonitis. In stitching up the stomach Lembert's sutures must be applied well beyond the wound at both extremities. Dr. George Woolsey[12] reports a case of a wound from a pistol bullet in the abdomen in which he had successfully sutured two wounds of the stomach, two of the transverse and two of the ascending colon, five hours after the injury. In all Lembert's sutures were employed. Mr. A. B. Johnson[13] describes an interesting case in a man, 35 years of age, whom he saw a short time after he had been shot. The bullet had not only passed through the stomach but had also wounded the jejunum, the colon, and the mesentery. He was able to close all the wounds and his patient recovered. In case of persistent hæmatemesis after injury the stomach should be opened if necessary, for it is possible, as in a case described by Dr. J. Hazelwood Clayton,[14] where the patient died as a result of a crush, for the mucous

[12] Annals of Surgery, August, 1899.
[13] Ibid., November, 1899.
[14] Brit. Med. Jour., March 24th, 1894.

membrane to be lacerated independently of the external coats of the stomach. In another case, described by Ziegler, a cyst appeared two weeks after a buffer accident and at the end of five months an operation was performed successfully and a large cyst of the stomach covered by the peritoneum was evacuated of three litres of fluid.

The older writers relate numerous cases of successful treatment of wounds of the stomach, but in many of them, such as that of Alexis St. Martin, a fistula was left. Spizharny collected 61 cases of gastric fistula. Fallopius successfully treated two cases of penetrating wound of the stomach, and there are many other cases of old and recent dates that can be referred to. The case I related under exploratory operations, where hæmatemesis followed on a stab wound of the abdomen, shows how a severe bruise of the stomach may lead to violent hæmatemesis without there being an actual rupture of the stomach wall.

Nearly all cases of spontaneous rupture of the stomach are due to ulcer or carcinoma, but we should not forget that there are a number of cases on record in which rupture has occurred from over distension. Arton reports a case in a negro, aged 50 years. Fulton mentions a case of rupture of the œsophageal end of the stomach in a child owing to distension. Collins describes a spontaneous rupture in a woman, 74 years of age; this was followed by collapse and death, and a necropsy showed a rupture two inches long about two inches from the pyloric extremity. The records of St. Bartholomew's Hospital contain the account of a man, 34 years of age, who for two years had been the subject of paroxysmal pain in the stomach. At the hospital he had an attack of vomiting after a debauch, and after a sudden attack of pain at the pit of the stomach he died. A ragged opening on the surface of the stomach near the cardiac extremity was found post mortem, there being no signs of gastric ulcer or cancer. Clarke[15] reports two cases, one in a Hindoo, 22 years of age, and another in a woman who was supposed to have died from cholera. Recovery probably never occurs naturally in these spontaneous ruptures, but there are many cases on record of recovery after stab wounds.

Perforation may occur from within, as in the case of sword and knife swallowers. A remarkable case of this kind occurred at Guy's Hospital in 1807. After death there were 30 or 40 fragments of knives found in the stomach, one of which had transfixed the colon and the rectum. Needless to say that in all these cases the sooner after the injury the patient is treated the greater will be the chance of recovery. The openings will require closing with a double row of sutures—a continuous catgut suture for the mucous membrane and Lembert's silk sutures for the peritoneum. The toilette of the peritoneum must be carefully performed. If the soiling be local this is best done by sponging, but if the peritoneal cavity has become generally soiled then the cleansing is best done by lavage.

CANCER AND OTHER TUMOURS OF THE STOMACH.

Cancer of the stomach, which is more common in men than in women in the proportion of two to one, may occur at any period of life from youth to extreme old age, but it is most commonly found between 50 and 60 years of age and it may be said to be a disease of middle or advanced age. I have had to perform gastro-enterostomy for pyloric cancer as early as 21 years of age and Dr. Norman Moore has recorded an instance of undoubted cancer of the stomach at 13 years of age. Habershon, in an analysis of 79 cases of cancer of the stomach, found the growth at the pylorus in 41 cases, along the lesser curvature in 11 cases, and at the cardiac extremity in 10 cases. Brinton found 219 cases of the growth at the pylorus out of 360 cases. Cancer is by far the most common cause of tumour of the stomach. Sarcoma occurs less frequently and usually at earlier periods. Dr. E. C. Perry and Dr. L. E. Shaw out of 50 cases of primary malignant disease of the stomach found sarcoma in four patients aged 15 years, 18 years, 38 years, and 67 years respectively.

Tubercle of the stomach is uncommon except in children affected with general tuberculosis. I have only operated in one case, in a girl of 12 years of age, who besides the pyloric stenosis due to tuberculous disease had stricture of the duodenum, general tuberculous disease of the stomach, and tuberculous peritonitis.

Fibro-myoma of the stomach is rare, but it may form a pedunculated growth projecting as a polypus into the stomach, and if it be away from the pyloric extremity it may produce no symptom until its size demands attention.

Polypoid outgrowths of the mucous membrane which may be termed "adenoma" or "papilloma" are uncommon, but in one case that came under my care a polypus of this nature was obstructing the pylorus, the obstruction being successfully relieved by its removal.

Hayem[16] describes a new variety of gastric polyadenoma which is constructed on the type of Brunner's glands in the duodenum. The varieties of polyadenoma of the stomach previously recognised are two—(*a*) those that are polypoid, and (*b*) those consisting of thickened folds of the mucous membrane, the constituent gland tubes being greatly lengthened but never invading the muscular mucosæ. This form also commonly occurs in a nodule and is then often associated with chronic gastritis and with cancer elsewhere on the stomach wall. Hayem describes two cases of adenomatous growth resembling Brunner's glands, and chiefly affecting the submucosa. It appears to be derived from the glandular cul-de-sacs of the mucosa, but it rapidly passes through the muscularis mucosæ and develops in the submucous tissue. This form of adenoma is related in an interesting manner to gastric ulcer and to malignant disease. In the first of Hayem's two cases a man died from a perforating gastric ulcer which was directly due to an adenoma of this form. The adenoma gave rise to atrophy and separation of the muscular coat, and then itself underwent infective ulceration. In the second case, in which a latent gastric ulcer had been succeeded by the development of carcinoma, the pylorus evidently became acutely obstructed by an adenoma of the type of Brunner's glands. Hayem regards these adenomata as benignant tumours which, however, may become malignant, and he places them in a transitional stage between innocent and malignant growths.

The stomach may also be the seat of lipoma, lymphadenoma, villous growth, and secondly malignant tumours. Fibroid thickening of the pylorus may form a tumour which can with difficulty be distinguished from malignant growth, and on two occasions I have performed pylorectomy in such cases under the impression that I was removing a cancer. Such a tumour is dependent on the deposit of lymph around a pyloric ulcer. The lymph becoming changed into fibrous tissue not only causes great thickening of the pylorus but leads to matting of the omentum around it and to puckering and hardening of the tissues that in some cases can only be differentiated from cancer on section or on microscopic examination. The long-continued history of ulcer may be the only guide to the diagnosis, but in this connexion it must be borne in mind that a chronic ulcer may end in cancer.

The following specimens from the Hunterian Museum are good examples of various forms of tumour:—No. 2411A is a cancer of the pylorus producing stenosis and is from a woman aged 36 years; No. 2417 is a cancer of the cardiac orifice with dilatation of the œsophagus; No. 2421 and No. 2422 are cancers of the cardiac orifice with cancer of the œsophagus also; No. 2426B is a colloid cancer of the pylorus producing stenosis; No. 2407 shows a perforation of the stomach due to sloughing of a cancer and is from a woman aged 36 years; No. 2408 shows a very small stomach with thickened walls due to new growth; No. 2408C shows a greatly enlarged stomach from cancer which caused death in six months; No. 2405 shows polypi growing from the mucous membrane of the stomach of a man, aged 76 years, who suffered from constant dyspepsia; No. 2405C shows a polypus near the pylorus producing fatal intussusception of the duodenum in a man aged 21 years; No. 2405D shows a polypus near the pylorus (pedunculated papilloma) which caused death by vomiting in a woman aged 92 years; No. 2407A is a villous growth near the lesser curvature found post mortem in an aged woman; No. A2407 is a melanotic sarcoma, two-thirds of an inch by half an inch in size, from a man, aged 31 years, who had other tumours in his skin and his interior organs; and No. 2427 shows a cardiac orifice obstructed by gumma which also involves the adjoining part of the liver. The patient was a military officer, 48 years of age, who had had symptoms for 20 years and who died from starvation.

Diagnosis.—When the symptoms and signs of ulcer of the stomach—with or without stricture but with tumour—are found at or after middle-age the probability is that the patient is suffering from cancer. Cancer of the cardiac

[15] Indian Medical Gazette, August, 1885.

[16] La Presse Médicale, August 4th, 1897.

extremity can seldom be felt until it has attained a considerable size. Unfortunately, cancer of the pylorus is often quite incapable of being distinctly felt until it has formed a fairly large tumour, though in most cases an indefinite sense of fulness and hardness leads to a suspicion of growth before it can be distinctly defined. The tumour usually moves up and down with respiration, and when the pylorus is free from adhesions it may be felt quite easily and well away from the costal margin. While in cancer of the cardiac orifice the stomach is usually contracted and small, in pyloric cancer it becomes dilated and the dilatation may assume such large proportions as to be the prominent sign. Inflation will not only enable an estimate to be made of the size of the organ but it will differentiate between a retro-peritoneal and a pyloric or stomach tumour, and will show the relation of the tumour to the stomach cavity. For instance, in a case which I saw recently I thought the tumour from its size and position to be one of the body of the stomach, but on distension with air I found it to be pyloric; and another that I believed from palpation and percussion to be a growth involving the cardiac extremity I found to be a tumour of the centre of the stomach with a dilated cardiac portion sufficient to permit of a gastro-enterostomy being performed. In cancer of the head of the pancreas there are usually jaundice and a distended gall-bladder, and inflation will show the relation of the stomach to the tumour. The bleeding in cancer of the stomach is usually shown as grumous vomit, seldom as a large hæmatemesis as in ulcer, and melæna is seldom found. The pain is more constant than in ulcer and not so distinct after food. It may be absent, but in one form or another is present in 90 per cent. of cases and is usually very severe. On examining the stomach contents after a test meal the absence of free hydrochloric acid is very suggestive of cancer, as is the presence of free lactic acid, but the presence of free hydrochloric acid does not negative the existence of cancer. Loss of flesh occurs from the outset and cachexia supervenes at an earlier stage than in cancer elsewhere. It would seem almost incredible that cancer of the stomach may exist in a latent form and produce death by exhaustion without any of the characteristic symptoms, but I have seen a case of this kind in a man, 70 years of age, and others have reported similar cases. Before a tumour is felt there may often be a difficulty in diagnosing between pernicious anæmia, tubercle, and cancer of the stomach, but when persistent indigestion comes on after 50 years of age for the first time it is very frequently due to cancer. At times carcinoma can only be diagnosed by the resistance present when the patient is deeply anæsthetised.

Prognosis.—As medical means can do nothing more than relieve the symptoms of cancer of the stomach, and as surgery holds out the only hope of relief or cure—moreover, as the earlier these cases are seen by the surgeon the greater is the probability of real good being done—it would seem to me that in every case where cancer of the stomach is suspected the question of surgical treatment should be considered at a much earlier period than is now the custom. It is unjust to the surgery of to-day to dismiss the treatment of this terrible disease in one page, as is done by the writer of an article on the subject in a recently issued and much read work on medicine. It is an important fact bearing on the future of cases operated on that out of 38 cases of cancer of the stomach collected by Dr. Perry and Dr. Shaw in 18 per cent. there were no secondary deposits found in other organs. Moreover, McArdle collected 1342 cases of cancer of the stomach of which 802 were limited to the pylorus, and out of this number 496 were suitable for operation. Gussenbauer and Weinwaster, as a result of the examination of the register of 542 cases of cancer of the pylorus, state that in 41 per cent. there was no metastasis of the disease to other organs, and that in 37 per cent. there were no adhesions, so that one may reasonably hope on this evidence to perform a radical operation in one case out of three or four cases of cancer of the stomach if surgical means be adopted sufficiently early. The wisdom of the radical treatment of cancer of the stomach is not yet admitted generally even by many skilful surgeons, to say nothing of the opinion of the profession at large; but I think that a careful study of the subject will show that cancer of the stomach, *quâ* cancer, is more favourable for radical treatment than cancer of the breast or of the tongue or of many other parts where its removal is undertaken with considerable success because it is undertaken early, and now that the technique of the radical operation is becoming more perfect I venture to predict that we shall in the future give our patients the chance of relief by operation more frequently and that the aid of surgery will be sought as soon as the disease is recognised. We must bear in mind the fact that every life saved is a life gained, so that if we only save 50 per cent. of cases by the radical operation it is well worth doing, since patients with cancer of the stomach can only at the best have a miserable and hopeless existence unless treated surgically.

Before considering the statistics of the various operations an analysis of cases in which the radical operation has been performed for the cure of cancer of the stomach by Professor Kocher, Professor Maydl, and Czerny will show that the prognosis is not so hopeless as is generally supposed.

The following are the results of operations for carcinoma of the stomach in the Berne Clinic by Professor Kocher.[17] The author has resected the pylorus in 57 cases, the mortality being only 8·7 per cent., otherwise over 50 of the cases recovered. Of these one, a woman, is still living 10 years after the operation, another five years, a third three years, and a fourth two years. Four other cases died from accidental causes or from other diseases after three years had elapsed. The results of pylorectomy for malignant disease from the Heidelburg Clinic[18] up to January, 1898, show 24 operations with nine deaths, which gives a mortality of 37·5 per cent. Life was prolonged for three months, seven months, nine months, 10 months, 11 months, 15 months, 20 months, and 31 months respectively in those which recovered, and in four cases the patients were alive at nine months and 11 months and at three and a half years and seven years after operation.

Professor Maydl has published the results of 25 operations which he has performed for cancer of the stomach. For the sake of comparison he divides these 25 cases into three groups. The first group comprises cases in which the patients died from the effects of the operation either directly or indirectly. These were four in number. The second group includes those dismissed from the hospital as "cured," but in which within a short period thereafter a recurrence of the disease took place and death ensued. These were seven in number. The third group, which is the most important, comprising 14 cases, included those cases in which the patients still live. This section he divides into sub-sections: (*a*) those patients who were living upwards of two years after operation, and (*b*) those patients who were alive less than two years after the operation. Of the first group four died—one from a sudden attack of gangrene in the right lower extremity, probably embolic from the tying of a vein, but this could not be confirmed as it occurred in a private patient and the friends declined to consent to a post-mortem examination. The other three died in two, three, and five days respectively after the operation from peritoneal symptoms and collapse with anæmia and exhaustion. The second group left the hospital in good health and apparently cured, but ere long had recurrence elsewhere and died. One of the seven cases may be looked upon as doubtful. This patient lived for 14 months after the operation and died from pleurisy with effusion, every other organ being found healthy at the necropsy. Even the appetite was unimpaired up to the very end and no disease could be discovered in or near the stomach. The other six cases lived for 12 months, eight months, two months, 20 months, 14 months, and 12 months respectively after the operation, or on an average for 11·3 months. Of the third group 14 are still alive. These were operated on on August 27th, 1890, on June 7th, 1893, on Jan. 27th, 1895, on March 1st, 1896, on March 20th, 1896, on Feb. 25th, 1897, on March 27th, 1897, on Jan. 30th, 1898, on Oct. 29th, 1898, on Oct. 31st, 1898, on Nov. 3rd, 1898, on Dec. 21st, 1898, on Jan. 4th, 1899, and on March 25th, 1899, respectively. If these be further sub-divided into two groups of over and under two years we get the patients who may be considered cured in the surgical sense of the term. Seven cases may be classed thus—eight years and eight and a half months, five years and 11 months, four years and three and a half months, three years and two months, three years and one and a half months, two years and two and a half months, and two years and one and a half months.

In considering the percentages the above figures of Professor Maydl give 16 per cent. as the proportion of those who die from the operation. In 28 per cent. the disease recurs, while 56 per cent. live. It may be remembered that C. Ewald of

[17] Annals of Surgery, September, 1899.
[18] Annals of Surgery, June, 1899.

Berlin condemned this operation on account of the mortality, he having had 73·3 per cent. of deaths, which was certainly not encouraging; but these results far exceeded those obtained by the pioneer of the operation, Billroth, who had a mortality of only 45 per cent. Billroth's pupil, Mikulicz, reduced this mortality to 32 per cent., while other operators—Kronlein, for example—had only 25 per cent., Carl and Fantino 45 per cent., and now Maydl's mortality stands at 16 per cent. and Kocher's at 8·7 per cent. The prognosis is at present much more favourable than it was in the past. In order to still further lower the mortality it will be necessary that patients be placed in the hands of the surgeon earlier than has heretofore been the case.

SURGICAL TREATMENT.

The treatment of cancer of the stomach may be radical or palliative. Of the radical operation we must consider (1) pylorectomy, more or less extensive (partial gastrectomy); (2) almost complete gastrectomy; and (3) total gastrectomy. Of the palliative means there are: (1) gastrostomy; (2) Bernays' operation; (3) gastro-enterostomy; and (4) jejunostomy. As each operation requires careful consideration I must take them seriatim. The first procedure will in all cases thought suitable for operation consist of an exploratory abdominal section and on the condition which is found will depend the after treatment. In Czerny's clinic there were 24 exploratory operations for cancer, with a mortality of 25 per cent., and the duration of life after operation was usually less than five months. I have myself performed eight exploratory operations for cancer of the stomach, and finding enlarged glands or secondary deposits have at once closed the abdomen. All the cases recovered from the operation and lived for various periods.

Preparation.—The bowels should be cleared either by an aperient or an enema the night before the operation, and the stomach should be washed out an hour or two before if the patient be in a condition to bear it. As these patients bear shock badly it should, if possible, be prevented. The operating-room should have a temperature of 70° F. and the patient should be enveloped in cotton-wool, which may be conveniently carried out by a long-sleeved jacket and long stockings made of Gamgee tissue. These were suggested to me some years ago by a lady on whom I had operated and she made me the first suit of cotton-wool clothes. They can be made by any nurse in an hour or two at a cost of a few shillings. An artificially heated operating table is an advantage, and if a specially heated table be not at hand an oblong water cushion filled with hot water or a series of indiarubber water bottles placed under the blanket of the operating table will take its place. An injection of 10 minims of liquor strychniæ, B.P., given before the administration of the anæsthetic, supplemented by another injection if necessary during the operation, is useful. An infusion of saline solution may be required, as in the gastrotomy for foreign bodies performed in 1894 and mentioned in my first lecture. The apparatus for transfusion should therefore always be ready as it can be used by a colleague while the operation is proceeding, or the saline fluid may be steadily injected in good quantities into the subcutaneous tissue of the axilla, either by means of a large syringe or by an ordinary aspirator needle connected with an indiarubber tube and glass funnel which can be easily arranged by a nurse and used continuously for a little time. After operation the patient should be placed in a warm bed and surrounded by hot-water bottles, and I always order a pint of warm saline fluid with an ounce of brandy to be injected into the rectum immediately after the operation, the injection to be repeated if the pulse seems to indicate its necessity.

Pylorectomy.—Pylorectomy, or the removal of the pylorus and as much of the adjoining part of the stomach and duodenum as may be involved, is an operation that was first demonstrated to be feasible on dogs by Merrem in 1810, but the first operation of the kind on the human subject was performed by Péan in 1879 and the first successful one by Billroth in 1881. The operation has been much modified since it was first performed, it being then done by suturing the open end of the duodenum, after removing the disease, to the open end of the stomach and closing by sutures the remainder of the stomach opening not fixed to the bowel. In one operation of this kind that I reported before the Royal Medical and Chirurgical Society in 1891 contraction of the newly-made orifice ensued some months later, and in order to avoid a like accident I modified the operation by employing a bone bobbin around which to join the open ends of the stomach and duodenum by sutures, thus securing adequate patency of the new channel.

As time is a very important factor in any operation on the stomach the rapid procedure of making the junction by means of a Murphy's button has found favour with many operators, though Professor Kocher speaks against its use. A further modification, and one which is now frequently followed, is to close completely both the stomach and duodenal openings either by a purse-string suture or by a double row of stitches, and then to connect the bowel to the stomach, making either a gastro-duodenostomy or a gastro-jejunostomy, whichever may be thought most easy and expeditious at the time. This will depend very much on the amount of stomach that has to be removed in order to get away the whole of the disease, for if much stomach has to be removed the open end of the duodenum will be less easy to fix to the stomach than a free loop of the jejunum. This operation is the one favoured by Professor Kocher and in his hands it has proved very successful. He uses strong forceps in closing the lumen of the stomach and bowel instead of employing digital compression, and he uses silk exclusively as a suture. Doyen's method of *écrasement* is very expeditious.

The performance of the operation *en deux temps* was suggested by Tupolske in 1891. He first performed a gastro-enterostomy and then, when the patient had recovered, he removed the pylorus three months later, closing the openings in the stomach and bowel and leaving the gastro-enterostomy opening to continue the communication with the intestine. This method has been followed by Quenu, Czerny, Hahn, Franke, Kümmel, Barker, and Doyen. It may certainly be advantageous in some cases where the patient is much exhausted and unfit to bear the longer operation of pylorectomy, as after the gastro-enterostomy strength will be gained and later the larger operation may be borne. The gastro-enterostomy may, however, give so much relief that the patient cannot be always brought to see the necessity of a second operation until it is too late to perform a successful pylorectomy. Haberkant's[19] statistics show that where adhesions were extensive the mortality was 72·7 per cent., whereas where there were no adhesions the mortality was only 27·2 per cent. Guinard's thesis shows a comparison between the results of the various methods of operating. In 148 cases of pylorectomy with end-to-end anastomosis the deaths were 56, or 37·8 per cent.; in 64 cases of pylorectomy with terminal and lateral anastomosis the deaths were 10, or 15·6 per cent.; in 54 cases of pylorectomy with lateral anastomosis the deaths were 24, or 44·4 per cent.; in four cases of pylorectomy by invagination the deaths were four, or 100 per cent.; and in three cases of pylorectomy in two stages there were no deaths.

TABLE XX.—*Cases of Pylorectomy or Partial Gastrectomy.*

Source of report of cases.		No. of cases.	Recovered.	Died.
1.	Billroth.	19	8	11
2.	Guinard.	299	194	105
3.	Czerny.	29	18	11
4.	Krönlein.	24	19	5
5.	Carle.	14	11	3
6.	Mikulicz.	20	15	5
7.	Hartmann.	10	6	4
8.	Willmott Evans.	13	12	1
9.	Morison.	5	5	0
10.	Kocher.	57	52	5
11.	Maydl.	25	21	4
12.	Roux.	12	9	3
13.	Tuffier.	9	6	3
14.	Lambotte.	5	4	1
15.	Van Kleef.	4	1	3
16.	Leeds Infirmary staff.	7	3	4
17.	Karg.	4	4	0
18.	Gussenbauer.	13	7	6
19.	Mayo.	3	3	0
	Total	572	398	174*

* Equals a mortality of 30·4 per cent.

References.—1. Archiv für Klinische Chirurgie, xxxix., pp. 785 to 844. 2. Thèse de Paris, 97.98, No. 484. 3. Stendel: Archiv für

[19] Archiv für Klinische Chirurgie, 1896, vol. li., p. 484.

Klinische Chirurgie, 1898, vol. lvii., p. 459. 4. Ibid., p. 449. 5. Ibid., vol. lvi., pp. 1 and 257. 6. Ibid., 1898, vol. ii., p. 9. 7. Terrier and Hartmann: Chirurgie de l'Estomac, Paris, 1899. 8. These are single cases collected from various sources and are not included in other series of cases. 9. Transactions of the Royal Medical and Chirurgical Society, vol. xxxii. 10. Annales of Surgery, September, 1899. 11. Medical Press, Oct. 11th, 1899. 12. Douxième Congrès de Chirurgie, Paris, 1898, p. 290. 13. Ibid., p. 311. 14 Annales de la Société Médicale d'Anvers, January, 1898. 15. Med. Tijdsch voor Geneesk, 1896, No. 6. 16. Hospital Reports, Leeds Infirmary. 1885 to 1899. 17. Twenty-seventh German Congress of Surgery, 1898. 18. Ibid. 19. Journal of the American Medical Association, 1898, vol. xxxi., p. 325.

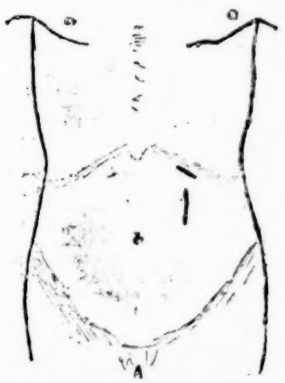
If the cardiac end of the stomach be involved the question of resection will be considered, and if decided on it may be carried out in the manner described by Levy. It presents two special difficulties—(1) danger to both pneumogastric nerves and (2) the difficulty of isolating the cardiac end of the œsophagus and fixing it to the stomach that is left. Levy [20] describes an operation devised by him, with the help of Fehlusen, for the resection of the cardiac end of the stomach. A rectangular incision is made through the abdominal wall, one limb running in the middle line from the ensiform appendage to the umbilicus, the other carried from the lower end of this through the whole breadth of the rectus muscle on the right side. The left half of the smaller omentum is separated from the stomach and the left coronary artery and vein are divided between two ligatures. After separation of the cardiac end of the stomach from the structures behind, the lower part of the œsophagus is isolated by dividing the serous membrane round this tube with scissors, exposing the anterior part of the œsophageal foramen in the diaghragm, and tying all visible vessels, mostly branches of the phrenic artery, at this part. At this stage there is a risk of wounding the pleura. The intestine being carefully protected by gauze the posterior wall of the œsophagus beyond the disease is stitched to a healthy portion of the stomach, and then the cardiac end of the stomach is divided by a succession of strokes, the cut edges of the anterior and posterior walls being stitched together after each stroke of the knife or scissors beyond the orifice left for the attachment of the œsophagus. This tube is now divided in a similar way, each portion as it is cut being stitched to the opening in the stomach. If the œsophagus be not fixed before it is completely divided it will retract and disappear above the foramen. The sutures are not carried parallel with the long axis of the œsophagus, but obliquely through its coats.

Gastrostomy.—If the disease has advanced so as to produce stenosis it will be beyond successful removal and gastrostomy should be performed, as in stricture of the œsophagus, in order to prevent the patient dying from starvation. Although Sédillot performed the first gastrostomy in November, 1849, the first successful operation was done by Mr. Sydney Jones on March 23rd, 1874. To Mr. H. G. Howse must be given the credit of greatly improving the operation by operating *en deux temps* and by splitting the fibres of the rectus so as to get a modified sphincter. The operation, however, has been, and is even yet, I fear, with many physicians still looked on as such a formidable procedure that even where it is strongly indicated the medical attendant frequently views it with so much disfavour as to lead him to discountenance its performance and to trust to sustaining existence in irremediable dysphagia by nutrient enemata. Death from starvation under such circumstances is, however, one of the most terrible experiences both to the patient and his friends.

Why has the operation of gastrostomy acquired this ill repute? In the first place because it was, and even yet is, as a rule, customary to defer it until the sufferer is so reduced by starvation and so enfeebled as to be unable to withstand the shock of any operative procedure. Even if he does not die from shock, his healing powers are so impaired as to lead to failure in union and then to death from wound complications; or his assimilative powers are so impoverished that even if the operation be immediately successful death ensues from exhaustion. In the second place, where a direct opening is made into the stomach the fistula in many cases speedily enlarges and becomes patulous, leading to leakage of food and of irritating gastric secretion, so that the skin of the abdomen tends to become excoriated and the prolongation of life is attended with considerable discomfort. Do these conditions still apply? I think I shall be able to show that if the operation be performed sufficiently early, and if it be done according to the best methods, it will be found that gastrostomy may be included among the most useful and beneficent of the palliative operations which the surgeon is called upon to perform. When abdominal section was attended with a high rate of mortality it was only natural that delay should occur in advising operation; but if it can be shown that early operation is not accompanied by mortality or that the mortality-rate is only a slight one, due to accidental or unforeseen complications, it will be justifiable to perform gastrostomy early, knowing that the small opening will close voluntarily if the cause of the dysphagia should disappear or be cured by treatment.

The operation which I am accustomed to perform is very simple and only occupies a few minutes; it is a modification of the Ssabanejews-Franks method, but it differs in several details. A vertical incision of about one and a half inches is made over the outer third of the left rectus abdominis, commencing three-quarters of an inch below the costal margin; the fibres of the rectus are separated, but not divided, to the extent of the incision and the posterior part of the rectus sheath and peritoneum are divided together, the opening being an inch in length. A portion of the cardiac end of the stomach is then brought up through the wound and held forward by an assistant until four sutures are inserted into the base of the cone by means of a curved intestinal needle, so as to fix the visceral peritoneum of the stomach to the edges of the parietal peritoneum. A transverse incision of half an inch is then made through the skin, one inch above the upper end of the first cut, and by means of a blunt instrument, such as the handle of a scalpel, the skin is undermined so as to connect the two openings beneath a bridge of skin and subcutaneous tissue. A closed pair of pressure forceps is introduced through the upper incision as far as the projecting part of the stomach and made to grasp the most prominent part, which it draws up to and beyond the surface of the second opening, where it is retained by means of two hare-lip pins. It should just fill the opening and should require no sutures. The lower opening is now closed by two or three silkworm gut sutures or by a continuous stitch and the edges are dried and covered with collodion and gauze. If needful the stomach can be opened at once by a tenotomy knife introduced between the pins, but if possible the opening should be deferred for 24 hours, when a barrier of lymph will have been thrown out. After opening the stomach a soft catheter, from a No. 8 to No. 12, is inserted, to which a piece of tubing is fixed and by means of a funnel the patient can at once be fed with warm milk and egg or whatever liquid may be thought desirable. The catheter may be left in position for a few days, after which I find that it is easy to insert it whenever a meal is required. The annexed diagrams (Figs. 7, 8, and 9) will demonstrate the steps of the operation

FIG. 7.



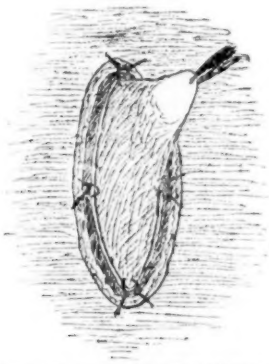
Showing the position of the two incisions.

better than words and it can be done almost more quickly than it can be described. If the patient is much exhausted, an anæsthetic may be dispensed with and cocaine employed, as the only pain experienced is caused by the skin incisions. I have performed this operation in patients from one year of

[20] Centralblatt für Chirurgie, No. 31, 1894.

age to 86 years of age and with most satisfactory results. Little or no shock is experienced, as although the peritoneum is opened there is neither exposure of viscera nor handling of any organ except the portion of stomach to be fixed, and I have never known peritonitis to follow. Where the operation is not deferred until "too late" death should not occur except from some accidental complication; for instance, I

FIG. 8.

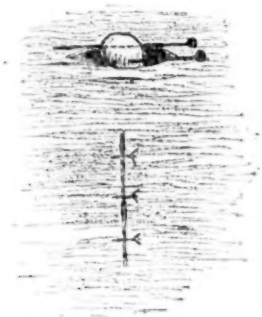


The stomach drawn out through the lower incision.

lost a patient at the end of the first week after operation from the unusual occurrence of an abscess caused by suppurating cancerous glands bursting into the trachea and flooding the bronchial tubes with pus.

Even after gastrostomy for malignant stricture of the œsophagus I have seen as much as a stone and a half gained in weight. In one case in which I performed gastrostomy three years ago for what I supposed to be a

FIG. 9.



The stomach fixed by means of hair-lip pins in the upper incision. The lower incision has been closed.

malignant stricture the patient gained his health and weight completely and some time afterwards he regained the power of swallowing a little fluid, not sufficient, however, to support life, and he still makes use of his gastrostomy opening for feeding purposes. He has a mere dimple to represent the site of the stomach fistula, into which he inserts without the slightest difficulty a No. 12 catheter. There is no irritation around the opening and even after so long a time there is no leakage of food or gastric fluid, so that he does not find it necessary to wear any apparatus or to have any dressing applied. In advocating, therefore, the earlier and more frequent performance of the operation of gastrostomy in cases of dysphagia insusceptible of relief by ordinary means, whether from cancer of the cardiac end of the stomach or of the œsophagus, I feel that I can do so as the result of ample experience of its beneficial results. Solid food may first be subjected to thorough mastication and insalivation, and then transferred by the patient from his mouth to a small funnel connected with the distal end of the catheter, where it is made to enter the stomach by blowing it through the tube, or it may be aspirated into the stomach by the patient's sudden respiratory efforts. Mastication of food as a preliminary step to its introduction into the stomach satisfies, at least in part, the sense of hunger which is not always accomplished even by liberal exclusive gastric feeding through the fistula.

It is quite impossible in the time at my disposal to describe all the modifications of the operation of gastrostomy, nor is it here necessary to do so, as they can be found in the text-books. I have performed the operation in various ways, but have had such success by the method which I have described that I can see no need to change it. The special methods are: (1) Greig Smith's, (2) Frank's, (3) Witzel's, (4) Marwedel's, (5) Kader's, (6) Paul's, (7) Jessett's, (8) my own modification of Ssabanejew-Frank's, and (9) Hartmann's, &c. The accompanying diagrams exhibited illustrate the chief varieties better than words can do. I have said that I prefer the method to which I am accustomed, but Greig Smith's method, Frank's method, Witzel's method, Marwedel's method, and Kader's method, all give good results. The obturators suggested by Mr. Harrison Cripps, Mr. J. M. Cotterill, and Mr. Bond, should not be required unless the gastrostomy opening be too large and should leak. In a case of cancer of the œsophagus on which I performed the operation suggested by the late Mr. Greig Smith my patient lived for 11 months in comparative comfort, during the whole of which time he never took a particle of food except by the artificial opening.

TABLE XXI.—*Statistics of Gastrostomy.*

Source of report of cases.	No. of cases.	Recovered.	Died.
1. Zerzas (up to 1875)	28	—	28
2. Lagrange (up to 1884) ...	163	30	133
3. Gross (up to 1884)	207	146	61
4. Powes	96	70	26
5. Mikulicz:			
Non-malignant...	10	10	—
Malignant	34	27	7
6. Rommers:			
Non-malignant...	18	17	1
Malignant	83	66	17
7. From hospitals in London	77	30	47
8. Leeds General Infirmary ...	36	17	19
9. Mayo Robson (private) ...	5	5	—
10. Loison	1	1	—
11. Dubourg	1	1	—
12. Trofimoff	3	2	1
13. McVicar	1	1	—
14. Maylard	2	2	—
15. Forgue	4	4	—

References.—1. Archiv für Klinische Chirurgie, 1885, vol. xxxii., p. 200. 2. Revue de Chirurgie, vol. v., p. 549. 3. Transactions of the American Surgical Association, ii., 363. 4. International Journal of Surgery, November, 1891. 5. Archiv für Klinische Chirurgie, 1896, vol. ii., p. 9. 6. Centralblatt für Chirurgie, 1898, p. 1134. 7. From hospital reports. 8. From hospital reports. 9. These cases are here reported for the first time. 10. Bulletin de la Société de Chirurgie, 1898, p. 439. 11. Société de Médecine de Bordeaux, July 15th, 1898. 12. Annales Russes de Chirurgie, 1898, vol. iii., part 5. 13. THE LANCET, Nov. 26th, 1898, p. 1406. 14. THE LANCET, August 20th, 1898, p. 475. 15. Presse Médicale, 1898, p. 145.

A comparison of the results of gastrostomy in the foregoing table shows that it is impossible to state exactly the death-rate of the operation, for practically in all the earlier cases the patients died and in nearly all the latter cases when performed sufficiently early they recovered. I do not think that it would be an exaggeration to say that if cases of incurable stricture of the œsophagus or of obstructive cancer of the cardiac end of the stomach were handed over to the surgeon at a sufficiently early stage the mortality would not exceed from 5 per cent. to 10 per cent.

If the pylorus be extensively involved there will be dilatation of the stomach, and if the patient be not in a fit condition to bear its removal, or if there be involvement of glands or secondary deposits, a palliative operation only can be performed. I do not think that Bernays's operation of opening the stomach and curetting the pylorus in order to make a larger channel is worth considering further, as it has

already been proved to give less relief than other operations, especially gastro-enterostomy, and to be attended with danger of hæmorrhage and perforation.

Jejunostomy.—Should the disease be so extensive as not to permit gastro-enterostomy the operation of jejunostomy may be considered. I have performed it twice, but as the operation at best can only prolong life for a very short time it is a procedure that cannot be strongly advocated. The following case, in which there was extensive cancer of the stomach with inability to retain food, is a good example. Jejunostomy was performed, the result being a recovery from the operation, but death from the progress of the disease at the end of two months.

A woman, aged 58 years, was sent to me on June 19th, 1891, by Mr. A. A. Hamilton of Crowle, on account of an abdominal tumour, accompanied by persistent vomiting and rapid loss of flesh. The patient was worn almost to a skeleton. Occupying the left hypochondrium and reaching into the epigastrium was a hard nodular tumour, moving up and down with respiration, the skin being quite moveable over it. A tumour could also be felt beneath the liver, which was diagnosed as a distended gall-bladder. On July 1st, 1891, the A.C.E. mixture being the anæsthetic and the skin of the abdomen having been asepticised, an incision of three inches in length was made in the linea alba above the umbilicus, exposing the tumour, which was found to be occupying the whole of the anterior wall of the stomach and to be incapable of removal. There was also a distended gall-bladder containing gall-stones. The jejunum was then found at its fixed point on the left of the spine and traced for about six inches downwards, at which spot a knuckle of the bowel was brought forward and fixed by loop sutures in the way suggested for gastrostomy by the late Mr. Greig Smith. A loop of silver wire was first inserted into the convex surface of the bowel at a spot where it would have to be opened. The rest of the parietal incision was brought together by interrupted silkworm gut sutures in the ordinary way. On the following day the patient felt quite comfortable and was fed by the rectum entirely. This was continued until the 7th, when a small opening was made in the exposed bowel with a tenotomy knife and a soft catheter was passed in, through which the patient was fed with peptonised food, of which she was able to take two or three pints a day. She gained flesh and was able to return home on the 27th. Her chief trouble was that the skin around the artificial opening became irritable, but through the opening into the duodenum she continued to be able to take a fair quanity of food, which was well retained. The original disease continued to advance and after two months she died from exhaustion. No necropsy could be obtained.

With regard to the operation of jejunostomy my experience would lead me to conclude that life can undoubtedly be lengthened by it in cases of cancer of the stomach too extensive for removal and where food cannot be taken; but it seems to me that it ought to be clearly stated beforehand to the patient that relief can only be hoped for and that existence under the circumstances may not be particularly comfortable, although life may actually be prolonged for weeks or even for months. An opening into the jejunum for feeding purposes is quite different from an opening into the stomach and is not nearly so satisfactory, as the edges of the fistula tend to become irritated by bile and intestinal secretion producing considerable discomfort. Maydl has proposed a modification of the operation of jejunostomy by cutting across the jejunum, suturing the proximal end into a slit in the side of the distal portion, and then fixing the cut edges of the distal end to the skin. The operation can also be done by the same method that I have advocated for gastrostomy. In my next jejunostomy I propose to perform the operation through the rectus and to do it in every respect as in my modified operation for gastrostomy so as to obtain a small opening with a species of sphincter; in this way the mortality ought to be very small, as the operation could be performed in a few minutes and the retention of food should be complete.

Gastro-enterostomy.—Of all the means for giving relief in obstruction due to cancer of the pylorus that cannot be removed, as also in many cases of simple stricture, gastro-enterostomy is an operation which is acknowledged by the greater number of surgeons as the most satisfactory procedure. Some surgeons advocate this operation to the exclusion of all others and seem to justify their conclusions by showing good results both as to immediate safety and the length of time that the patients are relieved; but it must not be forgotten that gastro-enterostomy is merely palliative and therefore cannot be considered on the same level with operations that may prove curative by the complete removal of the disease. In my last lecture I considered the operation of gastro-enterostomy very fully in connexion with dilatation of the stomach from pyloric obstruction. It is only necessary here, therefore, to refer to the results of gastro-enterostomy for cancer and especially as to the probable prolongation of life by the operation.

TABLE XXII.—*Statistics of Jejunostomy.*

	Name of surgeon operating or compiling cases.	No. of cases.	Recovered.	Died.
1.	Mayo Robson.	2	1	1
2.	Ogston.	1	1	—
3.	Pearce Gould.	1	—	1
4.	Golding-Bird.	1	—	1
5.	Terrier.	1	1	—
6.	Henle.	1	1	—
7.	Karewski.	1	—	1
8.	Maylard.	1	1	—
	Total	9	5	4*

* Equals a mortality of 44·4 per cent.

References.—1. Transactions of the Royal Medical and Chirurgical Society, 1892. 2, 3, and 4. Greig Smith: Abdominal Surgery, 1896, p. 550. 5. THE LANCET, Nov. 26th, 1898, p. 1440. 6. Allgemeine Medicinische Central-Zeitung, 1897, No. 58. 7. Berliner Klinische Wochenschrift, 1896, No. 60. 8. THE LANCET, Dec. 4th, 1897, p. 1454.

The mortality of gastro-enterostomy is much greater in cancer than in simple ulcer—e.g., Haberkant gives it in cancer as 43·5 per cent. and in simple ulcer as 25·5 per cent. Taking all collected cases together, from reports by Mikulicz, Doyen, Carle, D'Ewald, Czerny, Chlumskiji, Haberkant, and others, I find that the mortality is 38·3 per cent. It is rare for a patient with cancer to survive the operation for a year, and the average duration is probably only for from four to six months. Later statistics are much better than the earlier ones and the results in cases operated on in time are really good. The reason of the high mortality is undoubtedly the low state of the patient when placed under the care of the surgeon.

Total gastrectomy.—If the greater part of the stomach be invaded by growth and a careful examination of the adjoining parts reveals no secondary growths in glands or adjoining organs, complete or almost complete gastrectomy may be performed. Although total gastrectomy had been proved possible in animals the first attempt to remove the entire stomach in the human subject was made by Connor in Cincinnati in 1883, but the patient died on the table, and it remained for Schlatter of Zürich to perform the first successful resection of the entire stomach for cancer in a woman aged 56 years, on Sept. 6th, 1897. After removing the organ Schlatter fixed the œsophagus to a loop of small bowel by sutures and closed the cut end of the duodenum. Seven months after the operation the patient was well and had gained 6½ kilogrammes in weight, though she died at the end of 14 months from the time of operation. The second gastrectomy was performed by Ch. Brooke Brigham on Feb. 24th, 1898, in a woman aged 66 years, the œsophagus being fixed to the duodenum by means of a Murphy's button. In April the patient was well and had gained 6 lb. in weight in the previous week, but she was still below her weight at the time of operation.

The subjoined list (see Table XXIII.) compiled by Mr. Willmott Evans I believe represents all the published cases of complete gastrectomy up to the end of 1899.

If the growth be limited to the body of the stomach partial gastrectomy may be done by a free circular or elliptical incision, the opening being closed by a continuous chromicised gut suture to the mucous margin and interrupted Lembert's sutures to the peritoneal coat, all bleeding points being previously caught up and ligatured.

Partial gastrectomy.—In many cases both of sarcoma and cancer the disease has advanced well into the body of the stomach, and to get it away an extensive partial gastrectomy has to be performed. In Langenbuch's case in 1894 he excised seven-eighths of the stomach and sutured the pylorus to the small cardiac portion of stomach remaining, the

patient making a good recovery. This operation has been repeated quite a number of times by others and with considerable success.

TABLE XXIII.—*Cases of Complete Gastrectomy for Malignant Disease.*

	Name of surgeon operating or compiling cases.	No. of cases.	Recovered.	Died.	Remarks.
1.	Connor.	1	—	1	Died on table.
2.	Schlatter.	1	1	—	Lived for 14 months.
3.	Brigham.	1	1	—	Alive and well seven weeks later.
4.	Macdonald.	1	1	—	Alive and well six weeks later.
5.	Richardson.	1	1	—	Alive and well "several weeks later."
6.	Chavasse.	1	—	1	—
7.	Koble.	1	—	1	Died on table before œsophagus was divided.
8.	Bernays.	1	—	1	Lived for 36 hours.
	Total	8	4	4*	—

* Equals a mortality of 50 per cent.

References.—1. Medical News, 1884, vol. ii., p. 578. 2. Correspondenzblatt für Schweizerische Aerzte, Dec. 1st, 1897. 3. Boston Medical and Surgical Journal, 1898, vol. i., p. 415. 4. Journal of the American Medical Association, 1898, vol. ii., p. 538. 5. New York Medical Journal, 1898, vol. ii., p. 35. 6. Transactions of the Pathological Society of London, vol. l. 7. New York Medical Journal, 1898, vol. ii., p. 125. 8. Journal of the American Medical Association, 1898, vol. i., p. 341.

The following is a list of cases of almost complete gastrectomy in which at least three-fourths of the stomach has been removed for cancer:—

TABLE XXIV.—*Cases of almost Complete Gastrectomy in which at least Three-quarters of the Organ was Removed.*

	Name of surgeon operating or compiling cases.	No. of cases.	Recovered.	Died.	Remarks.
1.	Maydl.	1	1	—	One inch left at cardia; the patient was alive six hours later.
2.	Baldy.	1	—	1	Lived for 36 hours.
3.	Langenbuch.	1	—	1	Lived for six days.
4.	,,	1	1	—	—
5.	Schuchardt.	1	1	—	Only three finger's breadths left at cardia; the patient lived for two and a half years.
6.	Ewald.	1	—	1	—
7.	Hartmann.	1	1	—	Three-quarters removed.
8.	Lambotte.	1	1	—	Four-fifths removed.
9.	Kolaczek.	1	—	1	Three-quarters removed.
10.	,,	1	1	—	Seven-eighths removed.
11.	Breitung.	1	1	—	One centimetre left at each end.
12.	Tuffier.	1	1	—	Only a little left at cardia; the patient died four months later.
13.	Morten.	1	1	—	—
14.	Reberay Sans.	1	1	—	Two inches of posterior wall at pylorus left.
	Total	14	10	4*	—

* Equals a mortality of 28·5 per cent.

References.—1. Wiener Medicinische Wochenschrift, 1896, p. 1565. 2. Journal of the American Medical Association, 1898, vol. i., p. 523. 3. Deutsche Medicinische Wochenschrift, 1894, p. 968. 4. Ibid. 5. Beitrage zur Klinischen Chirurgie, 1897, vol. xix., p. 758. 6. Berliner Klinische Wochenschrift, 1897, p. 798. 7. Centralblatt für Chirurgie, 1898, p. 204. 8. Annales de la Société Belge de Chirurgie, Feb. 15th, 1898. 9. Allgemeine Medicinische Central-Zeitung, July 23rd, 1898. 10. Ibid. 11. Twenty-seventh German Congress of Surgery, 1898. 12. Bulletin de la Société Chirurgique, 1898, p. 245. 13. Brit. Med. Jour., 1899, p. 1083. 14. Rivista de Medicina, May 15th, 1899.

It seems advisable in these cases to close the gastric openings and establish a gastro-enterostomy with the remaining portion of the stomach, but the technique will depend on the amount of stomach removed and the state of the parts left: for instance, in Schuchardt's case the duodenum was united to the small portion of the cardiac end of the stomach, of the width of two or three fingers, that was left and the patient survived two and a half years and died from cancer of the pleura. It is interesting to note that in this case the portion of stomach left had, with the help of the duodenum, formed a digestive cavity with a capacity of 500 cubic centimetres and that the patient could digest ordinary food.[21] Mr. Charles A. Morton of Clifton read the notes of a successful case of resection of three-quarters of the stomach for malignant disease at the meeting of the British Medical Association on May 5th, 1889. The patient was a man, aged 39 years, who complained that for eight months he had had pain in the epigastrium and in the back after meals. He had vomited only occasionally. The patient was extremely emaciated but was able to take a little fish. On the left side of the abdomen above the umbilicus was a large, hard, irregular mass which varied in position and no certain diagnosis was formed. An incision of four inches in length was made through the abdominal wall and the growth was found to involve the greater part of the stomach, only the cardiac end being free. There were no enlarged glands or secondary growths. The omentum was ligatured and the stomach was turned upwards; then the gastro-hepatic omentum was tied and divided. The stomach was opened and a sponge placed in the œsophagus. The growth was then removed with the greater part of the stomach and the ends were closed by Lembert's suture. The duodenum was united to a fresh opening in the stomach by means of a Murphy's button. Drainage-tubes were left in temporarily. The patient recovered completely, but the button had not been noticed to pass. The growth was sarcoma. A case of extensive resection of the stomach for sarcoma in a woman, aged 52 years, is reported by Dr. Cantwell[22] of Texas, where after the excision of the growth the walls of the stomach were united by mattress sutures. The tumour weighed 12 lb. The patient made a good recovery, but a report eight months later said that there was a return of the growth. My colleague Mr. E. Ward has done three partial gastrectomies. In two of the cases the patients succumbed to the operation, but the first patient doubled her weight in three months.

In concluding my appointed task as Hunterian Professor I venture to hope that I have succeeded in demonstrating what an important relation surgery bears to diseases of the stomach, both simple and malignant. Fortunately, this class of disease is one where the improvement is readily seen both by the patient and his medical adviser, not only in the disappearance of painful and disabling symptoms, but by gain in weight. Hence a successful operation on a diseased stomach is one that yields peculiar satisfaction all round, and I can without hesitation say that I have had more expressions of gratitude from patients operated upon for diseases of the stomach than from any other class. I have tried to prove my points, not only by the relation of some of my own cases, but by statistical evidence gathered from all sources, and in the latter my work has been lightened by the kind assistance of Mr. Willmott Evans. I know how wearisome to the average reader is the study of tables of statistics, and I must apologise for introducing them so freely in these lectures, but I venture to think that they will be found useful for reference and to show, not only the actual risk of special operation, but also how great is the improvement that is taking place in the results of stomach operations generally.

I am proud to be able to say that my last 32 operations on the stomach in my private practice have all recovered, and I can see no reason why the success in this branch of surgery should not be as great as in the surgery of the gall-bladder, which now holds a very different position to what it did when I gave my first paper on the subject before the Clinical Society of London in 1885, nay, even to which it held when

[21] Beiträge zur Klinischen Chirurgie, 1897, vol. xix., p. 758.
[22] Annals of Surgery, 1899.

I lectured from this chair on diseases of the gall-bladder and bile-ducts in 1897.[23] In order, however, that surgery may attain to its maximum amount of success we must ask our medical colleagues for earlier diagnoses and earlier surgical consultation, so that if the case is one that can only be cured or relieved by an operation it may be performed before the recuperative powers have been lost. Then, and only then, shall we attain the ideal.

The Lettsomian Lectures

ON

PRACTICAL OBSERVATIONS ON CANCER OF THE BREAST.

Delivered before the Medical Society of London

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LECTURE II.[1]

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SOME POPULAR ERRORS IN DIAGNOSIS.

MR. PRESIDENT AND GENTLEMEN,—There are some delusions about cancer of the breast in which almost the entire public still have faith, as have, I regret to say, not a few medical men. They are partly the result of text-book statements not properly explained and partly the result of popular tradition. They are difficult to eradicate because there is just that small amount of truth in them which makes it possible to argue about them. But they are very deadly and dangerous delusions because they cause loss of time, and, as we saw at the last lecture, that is destructive of the only chance of cure which science offers—viz., early operation. I would reckon among them errors about heredity, about pain, about cachexia, and about nipple retraction.

Error about heredity.—This question we have already discussed and need not further refer to, except to repeat that the absence of any cancerous taint among relatives is to a woman a very strong inducement to say nothing about any suspicious growth she may feel in her breast, because she comforts herself with the idea that it cannot be cancer as such a thing was never known in her family.

Error about pain.—This error is a most serious one. A few internal cancers, such as those of the liver and lungs, are sometimes almost painless in their whole course, but the termination of all external cancers, at all events, is invariably accompanied by severe suffering. These dreadful cases appeal so distressingly to the minds of women that they always associate pain with cancer. But unfortunately there are no neoplasms which produce less pain in their early stages than cancer. As the female mind, then, invariably associates the presence of pain with cancer, so its absence means to the patient that there is no cancer. If she has no pain in the lump and never heard of the disease among her relatives she is very unwilling to tell her medical man what she has in her breast. This remarkable absence of early pain is regarded as all the more of good omen by reason of the fact that in a large proportion of cases the patient discovers the lump in her breast by accident. Men do not, as a rule, wash their breasts very much, but women do, and certainly the most frequent way in which the patient tells the story of the discovery of her enemy is that it occurred as she passed her hand over her breast while washing. So far from regarding pain as a sign of cancer, when a patient comes to tell me that she has detected something abnormal in her breast and that it is very painful, I am always glad to express my pleasure at hearing this statement, inasmuch as the disease is then probably not malignant. Pain in certain cases is by no means an evil.

Error about cachexia.—The error about cachexia is chiefly made by medical men. Often after examining a patient with some medical friend I have been struck by his remarking: "Well, but look at her ruddy colour and healthy aspect. There is no cancerous cachexia there." As in the case of pain, we have here an old superstition, a deeply-rooted popular belief to the effect that a patient who has cancer must have a pallid, emaciated, and haggard appearance. When fœtid discharge and agonising pain and sleepless nights and mental distress and absorption of septic products have done their work, then it is true that the unfortunate patient does present the appearance of a cachexia, but certainly not at the beginning of her disease. We have already noted that the victims of cancer are usually well-nourished persons, often with a fine healthy colour in their cheeks. Many a time I have pointed out to students in the out-patient room some jolly-looking, ruddy-faced man, with hair just turning grey, a big comforter up to his nose and a tuft of cotton-wadding sticking out of one ear, and I have said: "That man has cancer of the tongue." In cancer of the external parts cachexia is practically of no aid diagnostically, because in its early stages there is none, while in the later stages the growth is apparent. But I admit that in certain forms of intestinal and other internal cancers, where the symptoms are very obscure, the facts that the patient has lost his ruddy colour and has become pale and waxy, that his aspect is pinched, and that he has lost flesh and shrunk in his clothes—in short, the existence of cachexia—are important points.

Nipple retraction and skin adhesion.—Any error with regard to these can only be made by the practitioner and not by the patient. Perhaps the majority of text-books have hitherto somewhat misled the student on these points. It has been given out too broadly that retraction of the nipple is a sign of carcinoma, while the statement has not been sufficiently qualified by clearly indicating to the tyro that the sign is only of the least value when the disease happens to be situated immediately beneath the nipple. If the tumour has its site at any distance from the central point then retraction naturally does not occur. To persons thoroughly conversant with the matter it seems strange that it should be necessary to point out to anyone that the central point of the mamma can only be interfered with by disease that underlies that central point. As an actual fact, however, I know that the mere presence or absence of nipple retraction, without reference at all to the position of the cancerous mass, is too often appealed to by young practitioners. But if the absence of nipple retraction is no diagnostic sign in cases where the disease is situated away from the centre of the gland, it is, on the other hand, practically pathognomonic when it lies beneath it.

As we all know, adhesion of the skin is a very grave indication of a sub-lying cancer. It does not occur with any other tumour, except with an inflammatory swelling of the nature of an abscess. But there is a different appearance in the skin in the two cases. In the inflammatory adhesion the skin is fairly smooth over the abscess or whatever of an inflammatory nature underlies it. But over a carcinoma, if you try to pinch the skin up between the finger and thumb, immediately a number of fine points appear which are the hair follicles caught and tucked down by the cancer. It is exactly like the leather of a saddle, insomuch that I have always demonstrated it to students under the name of "pigskin." I regard this "pigskin" appearance as almost certainly indicative of subjacent carcinoma.

WHAT ARE THE CONDITIONS WHICH MOST CLOSELY SIMULATE MAMMARY CANCER?

Chronic mastitis.—To recount one's own mistakes is the most telling way of communicating information to others. I know that I have several times confounded a piece of chronic inflammatory induration with carcinoma. I can recall very clearly three cases. Curiously enough, the three patients were all married women between 35 and 40 years of age, comparatively spare in form and childless—a kind of person, by the way, who has always seemed to me more prone to chronic mammary induration than the stout, plethoric woman who has had a big family. When the condition becomes pronounced the whole breast comes to resemble a hard, flat cake. You can lift it off the pectoral muscle in a mass. Here and there throughout it are points of extra hardness, like knobs or bosses; one of these bigger than its fellows is the suspicious object. The question arises: Is that hard knob simply a bit of extra hard chronically indurated tissue or is it a piece of malignant disease?

[23] THE LANCET, May 29th (p. 1451), June 5th (p. 1525), and June 19th, 1897 (p. 1666).

[1] Lecture I. was published in THE LANCET of March 10th, 1900. Lecture III. will be delivered on April 2nd.

In point of mere hardness there is nothing to choose between either condition. Feeling alone gives very little help, while the difficulty is increased by the fact that throughout the rest of the breast are points which are only a little less in size and a shade less hard than the one which has given rise to suspicion. It is very difficult to give any precise rules by which to recognise a bit of indurated mastitis from a bit of carcinoma. Experience alone helps. But it may be noticed that in mastitis skin adhesion is very rare and so is glandular enlargement. The adhesion if it exists is not of the "pigskin" type, while, when axillary glands are to be detected, as they are in thin women, they are so hard that this feature alone distinguishes them.

Small chronic abscess.—Probably the thing which is next most commonly mistaken for cancer is a small, deep collection of pus, surrounded by a zone of inflammatory thickening. Not many years ago I saw a surgeon whip out a breast for a supposed scirrhus. When the breast was cut up after removal, before being handed round to the students, the tumour was found to be a small abscess with a condensed mass of inflamed tissue around it. At the first blush one would think this mistake a very unlikely one to happen, but it is not so. The deep-seated, ill-defined, hard, inflammatory mass, surrounding so small a quantity of pus that fluctuation cannot be detected in it, has a marvellous resemblance to a piece of carcinomatous tissue. Moreover, the delusion is heightened by the fact that there is often a little adhesion between the skin and the swelling beneath, but, as we have just seen, it is not of the genuine "pigskin" order.

A small fibro-adenoma.—A condition very like the hard point in a case of chronic mastitis, to which allusion has just been made, is produced by a small fibro-adenoma. I recollect a very nervous woman coming into hospital with what I believed to be a tumour of this kind. She was extremely timid and only after considerable pressure consented to have the growth taken out, and that on the express understanding that nothing more was to be done. But when we came to the growth it was found to be scirrhus, although the signs of a fibro-adenoma had been so marked that I had been at some pains to point them out to the students as very characteristic of that form of tumour. I removed it freely. The patient was told what had been found and was begged to return to report herself from time to time. This, however, she never did, being a most foolish and nervous creature, and we saw nothing of her for a considerable period, until she came back again with the whole breast a hopeless mass of cancer. In point of hardness a small fibro-adenoma scarcely differs from a scirrhus, but the great diagnostic point is the absence of the "pigskin" and the total want of all glandular enlargement.

A small, very tight, simple cyst.—I learnt this first from seeing a surgeon of great experience proceed to cut out a breast for cancer. He gave his reasons for thinking that the tumour was malignant, but said that as the growth was only small he would cut into it before removing the breast in order to make assurance doubly sure. He did so. A tablespoonful of brownish fluid escaped and the tumour disappeared. I once afterwards did the same thing before a crowd of students, even though perfectly aware of the liability of mistaking a very tense cyst for a scirrhous mass. Many years elapsed and I did not fall into the trap again until a few months ago, when I diagnosed a very deep-seated tight cyst as a malignant growth. If the cyst is near the surface of the mamma the difficulty is not great, but if it is deep down its margins become obscured. The diagnostic features are that the tumour is round, smooth, sharply defined (unless it is very deep), and freely moveable, while there is never any skin adhesion or glandular enlargement by any chance. I was very pleased to notice that Mr. Marmaduke Sheild, in his excellent work on "Cancer of the Breast," says with regard to the diagnosis of carcinoma from cysts and abscesses: "It is in these cases that the most disastrous errors are made in matters of diagnosis of mammary disease. It will be well at the outset to point out that if any surgeon thinks he is clever enough to certainly distinguish between solid tumours and some of the more peculiar abscesses or cysts found in the breast without exploratory incision he will sooner or later make an egregious error."

In connexion with the diagnosis of mammary tumours there are one or two points of practice which if employed as a matter of routine might save an operator from occasionally falling into an error of what may be termed a public character. (1) I never remove a breast without first cutting into the tumour, so soon as the patient is anæsthetised, and on sundry occasions I have been extremely glad that I did so. I confess to frequent mistakes, being aware that omniscience is the exclusive property of very young men. (2) I frequently use a small exploring trocar and cannula for diagnosis. I know that this practice has been much condemned. I was taught that it was very dangerous, but I found by practical experiment that it was nothing of the sort. It was held that it inflamed the tumour and accelerated its growth, and so if the tumour were inoperable it did damage to the patient. This view was quite true, because surgeons formerly put large and dirty trocars into the interior of solid tumours and inoculated them with septic material. If an exploring trocar and cannula with a metal handle be used, which can be boiled and then passed through a spirit tube, no harm whatever will result. On the contrary, many dubious questions can often be settled at the cost of a most trifling amount of suffering and to the enormous mental relief of the patient. (3) I always examine a breast tumour in three positions. In examining, say, the left breast in the first position the surgeon should stand behind the patient with his left arm passed beneath her left armpit and his right arm over her right shoulder. The surgeon should be steady on his feet and the patient should be asked to press back against him. He can thus regulate the pressure which he is putting on with his hands to a nicety and make the best possible use of his sensibility. When the breast is examined from the front the surgeon puts a certain amount of pressure upon it and the patient yields from it, and so the judgment of weight so essential to determining the nature of a soft body is lost. In the second position the patient should be seated in a firm chair and the surgeon should examine the breast from the front. In the third position the patient should be on her back on a sofa. Now, in each of these positions the surgeon will acquire a new appreciation of the tumour, but the first is by far the most effective, for in it he will avoid the mistake so liable to be made in the other two (especially the third) of crumpling up a mass of sound tissue so that it comes to feel just like a tumour. All things under the chin, down the neck, in the breasts, and in the groins should be examined by the surgeon standing behind the patient. In examining a hernia, for instance, the surgeon, having first restored the bowel, can, by standing behind the patient, constitute himself an animated truss and can determine the exact spot where the truss-head will best control descent and also judge the down-push caused by coughing, so as to estimate the power required for the truss-spring. Students are not nearly enough impressed with the great value of this method of examination. It was Paget who first showed me the necessity of examining a breast in all three positions.

ACUTE MANIA AFTER OPERATIONS ON THE BREAST.

A matter which is worthy of some little attention is the occurrence of acute mania after operations on the breast. That this occasionally comes on after any kind of operation is true, but there are some after which it is more common than after others. It seems to be only comparatively recently that it has been taken distinct notice of. Dr. S. Rutherford Macphail of the Derby County Lunatic Asylum has written a short but eminently useful and practical statistical account of lunacy after surgical operations,[2] from which I have extracted the following figures. His own experience of the malady embraced 900 admissions of all kinds to his asylum, of which 40 were post-operative—viz., 13 males and 27 females. Of the 27 women no fewer than 15 had been the subject of gynæcological operations and of the remaining 12 five had been subjected to ophthalmic operations. Of the 13 male cases four were after ophthalmic proceedings and the rest after general operations of all kinds. All who have written about the subject apparently agree that the vast preponderance of cases occurs after gynæcological and ophthalmic operations. Dr. J. Christian Simpson in his work on Cerebral Symptoms relating to Surgical Disease speaks of a record of 185 cases by Sears, of which 50 were gynæcological, 62 were ophthalmic, 45 were general surgical, and 10 were after excision of the mamma. Rianan out of 186 cases had 65 gynæcological and 35 ophthalmic cases. But, as showing how statistics often come utterly to grief, Dr. Denis[3] reckons that out of all cases of operation 2·5 occurred in

[2] Brit. Med. Jour., September, 1899.
[3] Montpellier Thesis, 1889.

each 100. Dr. Simpson, however, proceeding to examine the records of operations of all kinds done in Professor Annandale's wards from 1882 to 1894 found that out of 5500 he could only find 11 cases of mental derangement, being about 2 per 1000, a very different thing from Denis's figures. In my own experience I can only remember among general cases one male who became maniacal after operation. He had a large sarcoma removed from just below the axilla and after about a week he became maniacal and continued so for three weeks, after which he recovered and remained well for some years. There was nothing wrong with the wound in this case. One female died from acute mania after excision of an epitheliomatous ulcer of the rectum. But among my cases of removal of the breast I find eight in which acute mania supervened. Of these two were maiden ladies between 50 and 60 years of age who were women of excellent intellect and highly cultivated, both great readers. One of them was rather melancholic than maniacal, becoming so about a week after the operation and remaining so for several weeks before the condition completely wore off. The wound united by primary union all through and there was no rise of temperature. The other began to be queer in a few days after the operation and for more than a fortnight talked very amusing and sometimes clever nonsense. In her case the wound broke completely down and suppurated profusely, because she was never still when awake. But it was never septic and there was no rise of temperature, while the patient never became weak or looked ill. Both of these ladies are sound mentally as ever, one nine years after the operation and the other two and a half years. The next two cases occurred in hospital. Nothing especially went amiss with the wounds. One patient recovered completely, but the other never quite regained her mental condition and ultimately died in a lunatic asylum.

Next I note four cases which all proved fatal and I will add to them the female mentioned above who died after the removal of a cancer from the rectum. Let us call them A, B, C, D, and E, the last being the case of cancer of the rectum. To begin with, they were all private patients and in excellent circumstances. A's wound never became aseptic, but she became melancholic and died on the thirteenth day after the operation. Her own mother and her sister died from cancer, and she was the second wife of a gentleman whose sister and first wife had died from cancer also. These depressing circumstances no doubt seriously affected the patient. The symptoms in Case B appeared on the fifth day. I only saw the patient once after the operation as she lived in another town, but her medical attendant sent me a very full report of her case. She exhibited extreme likes and dislikes and one nurse had to be sent away because she would not tolerate her presence. Then she became violent and talked and kicked about incessantly. She jumped out of bed if not constantly watched, and once she made her way into an adjoining room before she could be stopped. Curiously enough she allowed her wound to be dressed and would even help in the process. At death it was practically healed. Her medical man had only attended her a very short time, but he subsequently learnt that she was a mysterious old widow who had married unhappily a second time and who had lived away from her husband under an assumed name. When well she had attacks of mental derangement, and there was insanity in her family. When her effects were being routed out a great quantity of spirit bottles were found secreted about the house which showed that she was probably a secret drinker also. The patients in Cases C, D, and E were practically maniacal before they were operated upon. One was married and the other two were widows. They were all between 50 and 55 years of age, and were all noted as being flighty, singular persons and very vain even when in good health. When they learnt that they were the victims of cancer their terror became indescribable. It was most distressing to have anything to do with them, and the interviews and consultations were very painful. On the day of operation it was noticed that they were all preternaturally calm and composed. Doubtless this involved a great mental effort. In the course of a few days the wounds all broke down and suppurated profusely (although not in any way malodorous) while the temperature was high. They all talked, shouted, shuffled about unceasingly, and kept wanting to get out of bed. One of them (the subject of cancer of the rectum) did escape from bed and got on to the landing of the staircase. At times they would be quite collected and rational and would speak sensibly for a short period. They all took nourishment fairly. Now, as the wounds suppurated and as the temperature was high one must admit that septic infection was present and helped to cause their deaths, and it may reasonably be argued that the delirium was simply the delirium of septicæmia. But this was not the case. It began too soon after the operation and before the wounds began to break down and suppurate. Moreover in former days I have unfortunately seen too many persons die from erysipelatous and septic wounds and in my experience they have never been violent and furious. They lay quietly muttering and moving uneasily, but they did not get out of bed and run out on to the landing and into the next room. They had not the strength for that. To conclude this point, cases of post-operative mania have often been referred to the use of carbolic acid and iodoform. There seems no proof of this. Such toxic effects as may have occurred in this way have been transient in their duration and have passed off at once on the drugs ceasing to be used.

CHRONIC MAMMARY INDURATION—CHRONIC INTERSTITIAL MASTITIS.

I would now like, gentlemen, to dwell with you for a while upon a subject of immense importance in connexion with mammary cancer. I allude to chronic inflammatory induration or chronic interstitial mastitis. Billroth termed it "chronic cirrhosing mastitis." There are sundry forms of this described. One is known as Diffuse Chronic Mastitis. It is described as coming on with tenderness and swelling without febrile symptoms while the affected part becomes tumid and painful. The whole gland and even the overlying nipple may become involved. The affected skin has the appearance of being adherent, thickened, and rough-looking (*peau d'orange*). Then, the inflammatory process subsiding, a cirrhosis takes place, the breast diminishes in size, and the nipple and skin are drawn in. The contraction being irregular the breast becomes eventually a mere shrivelled nodular structure. The axillary glands may also enlarge and there may be a watery discharge from the nipple. Now I must confess that in all my experience I have never seen anything like this—anything, I mean, so definite in its course and so startling in its results. So that surely such marked cases of chronic mastitis must be rare. Doubtless they occur, for the disease is described and the shrivelled organ figured by Billroth, but I think this form need not enter into our calculations. The most common form with which we are all acquainted is that which pathologists call the "periductal" form, the *maladie noueuse* or plexiform fibroma of the French. Surgeons here call it Chronic Interstitial Mastitis. It seems to be simply a very slow and painless variety of the preceding form where the inflammatory process confining itself strictly to the neighbourhood of the glandular tissue proper results in a fibrous sclerosis. Bits of the gland may be affected or the entire organ. In the latter case the breast feels like a hard pancake which you can lift up from the subjacent great pectoral muscle. All through it are scattered hard masses from the size of a pea up to that of a broad bean. Besides these larger pieces there are little minute nodules scattered all through the gland. The microscope shows these to be small cysts, structures produced in all tubular glands under cirrhotic conditions. Sometimes only a portion of the gland is affected while the rest is healthy and soft, but I see no reason for elevating such cases into a special class.

Thus, then, if a chronic mastitis continue to progress by developing more and more connective tissue, what happens is the production of a cirrhosis with pressure destruction of the glanduiar tissue, with the formation of small cysts, and finally with completed shrinkage of the whole breast, this process being accompanied by the formation of nodules almost approaching the characters of small fibroid tumours. If this be the bent of the mastitic change it is a happy thing for the patient, for no malignant state supervenes. But, as we shall see, the mastitis may progress by a more dangerous method—viz., by the immense proliferation of intra-glandular epithelium which some day will burst its bonds and erupt into the surrounding connective tissue. This is cancer.

The disease is essentially one of the climacteric period and, in my experience, seems to be as common in single as in married women. I have not been able to detect any connexion between it and acute puerperal abscess and, as bearing upon the production of cancer by injury, I cannot remember patients making definite allegations that it arose from blows or traumatism of any kind. On the other hand,

as I mentioned in my last lecture, the statements of patients concerning the direct connexion of their cancerous growths with injury and the presence afterwards of slight pain or uneasiness at the point thereof have appeared to me to be worthy of more serious consideration than has been given to them and should not be dismissed at once as mere silly tales.

The principle of treatment of chronic mastitis by pressure, gentle friction, and the use of local remedies, such as used to be called "discutients," seems to be reasonable. I have a routine practice which is distinctly serviceable and which, I imagine, most practical surgeons employ also with variations. The patient is directed to bathe the breast for five minutes morning and evening with very hot water applied by means of a big cone-shaped sponge. Then there is rubbed into it mercurial ointment during one week and liniment of iodide of potassium with soap during the next week, the inunction being done with the greatest gentleness. After a while this treatment is apt to make the skin of the breast very tender and to produce crops of painful little pustules. It should be entirely left off and ointment of zinc should be smeared on until the skin irritation has subsided. Stays must be abandoned and the breast must be covered with a layer of cotton wadding. Pressure is applied by means of a broad elastic webbing bandage. The first turn is brought round under the armpits and fastened with a safety pin, and then the patient can pull on the remaining turns as they go down over the mamma as tightly as she can bear, fixing the bandage at the short ribs with another pin. The patient may take a moderate dose of iodide of potassium morning and evening, unless it proves very disagreeable to her; but after all it is without doubt in the local treatment that confidence is to be placed. Of course, I know that mercury and iodide of potassium are very old-fashioned remedies, but I still have belief in them and in their efficiency as "discutients" of chronic inflammatory indurations. But probably these simple views will not find favour with the practitioner of to-day for whom a new drug has to be provided once a week from the pill and capsule blast furnaces of America and Germany.

Only a generation ago the universal teaching was that an innocent or non-malignant tumour remained so always and never changed its character, while a cancerous or malignant one was so from its very earliest inception and never could be anything else. Surgeons have been compelled slowly to work themselves round to quite the opposite belief. It would almost seem with our present knowledge that with the exception of simple cysts and pure fibromata or myomata there is no neoplasm, however innocent in its commencement, which may not in time, perhaps after very many years, degenerate into malignancy. I have seen on two occasions even that most simple of all tumours, the lipoma, followed by what is called fat-sarcoma, requiring two or three operations of most extensive character for its extirpation.

Now, the degeneration of chronic interstitial mastitis into cancer is of course perfectly familiar to all operating surgeons. But I very much doubt if this knowledge is as thoroughly diffused throughout the profession as it ought to be, or rather I should say that I question whether medical men at large attach to it the immense importance which the matter deserves. A little while ago I said that I thought that attention might now be diverted from the devising of new operations for mammary cancer, for I believed that for the present they had in the majority of cases reached the limit of real use and that the whole energies of surgical teachers should be thrown into the propagation of the gospel of early diagnosis. For there is no more difficult case in the range of breast surgery than to know what to do with a breast, obviously the subject of chronic mastitis, in which among several very hard points there are one or two which are of such special hardness that it is impossible to tell whether they have degenerated into cancer or not. My own practice is that if the preponderance, the distinct preponderance, of evidence makes for nothing worse than chronic mastitis pure and simple, naturally the treatment above referred to should be at once put in practice, but even then the patient should be seen at regular intervals until all hardness is quite gone. For I have repeatedly seen the breast clear up from all induration, to the great delight of the patient, except at one spot, and there the cancerous limit had been reached and overpassed. When, on the other hand, the balance of probability is that the cancerous limit is being reached, even when to the touch no absolute certainty thereof is communicated, I have for many years practised and taught that removal of the breast is a justifiable proceeding. The way in which I have done it is by making a semilunar incision along the lower border of the mamma, dissecting up the skin and nipple, and laying them down again after the gland is removed, provided there is no sign that palpable carcinoma exists. How is this to be known? By cutting through any suspicious mass or nodule. I am quite sure that the section which an experienced surgeon makes with a knife through a fresh piece of carcinoma will enable him to give a far more decided and certain opinion than anything which the microscopist can give. Not that for a minute I would speak disparagingly of the value of microscopical examination. When it coincides with the naked eye view of the clinician so much the better, but when they differ I hold that the history of the tumour and the look and feel of the fresh section constitute the most trustworthy guide. An error may always be made by taking a microscopical section from a limited portion of the tumour where the process of growth is not actively going on. Moreover, there are inflammatory conditions of organs which so simulate in appearance certain malignant states that the ablest microscopist will admit himself unable to give a positive opinion about them. But the colour, the resistance to the touch, and the feel to the knife of a fresh mammary tumour section, however small that tumour may be, are the most certain guides of all as to its nature. With regard to the retention of the nipple and areola it must be remembered that they are to a woman the signs and symbols of a mammary gland which is a distinguishing feature of her sex. There are many women whose breasts when past middle life are so small and shrunken that but for the nipple and areola it would hardly be known that any breasts existed at all. I have an "impression" that chronic mastitis is more common in small breasts than in big ones, but it may well be said that this may arise simply from the disease being more easily detected in a small breast than in a big one. Still, having made a very great many naked-eye sections of cancerous breasts, the apparently sound gland tissue (away from the cancer) in a big, fat breast has rarely the tough hardness characteristic of a piece of chronically inflamed material. Referring again to the nipple and areola, if these be left to the patient she does not think so much of the loss of the gland itself. A man, similarly, will be quite content with a very wooden-nutmeg kind of testicle which is certainly useless functionally if only he be allowed to retain it in his scrotum as the badge of his sex. Assure the patient that her breast will not be materially disfigured and she will generally consent to anything to get rid of the haunting dread of that terror of her life—mammary cancer. But what if there should be more than mere mastitis? When the skin is being raised any suspicious point or points should be cut into, and if any one of these look cancerous then skin and nipple as well as the breast can be swept away too and the axilla cleared out, just as for an ordinary well-recognised case. A short time ago this very case happened to myself. Yet the patient's first shock of disappointment when she learnt what had been done was soon relieved by her satisfaction at feeling that she had been freed from her enemy. It is many years ago since I first proposed to the surgical profession that in every case of cancer where the breast was removed in the hope of ultimate freedom from disease the axillary glands should be removed as a necessary part of the operation. My argument was that it was impossible to tell whether they were involved or not, particularly in well-nourished persons. That argument has eventually prevailed over much opposition; and now to-day I would desire to impress upon the profession that it is a right and proper thing in many cases to remove breasts the subjects of chronic mastitis even before cancer has been definitely diagnosed in them. The questions, and proper ones, at once arise, To what excesses may a doctrine like this not lead? What absurd and unnecessary surgery at the hands of the "enterprising surgeon" may not arise from this? Nay, may it not be a direct incitement to certain of the more needy class of surgeons to do operations for the sake of fees? I admit these possibilities, and yet I have such confidence in the good judgment and probity of the English surgeon beyond all other surgeons in the world that I believe that the evil that may occur in this way will be far outweighed by the saving of life affected by the removal of nascent cancers. We know how absurdly overdone the removal of the appendix has been in some countries, until it became

positively the subject of public merriment. And yet with all this misuse many lives have been saved by it, while the operation is meantime quietly finding its proper level and sphere of usefulness.

I have seen several cases of chronic mastitis in men and curiously enough they have all been in private practice. One of the things that, I think, produces it in them is the rubbing of braces and brace-buckles and these, of course, must be at once removed and a belt must be worn. The course of treatment above mentioned seems to be perfectly successful. One case of this nature occurred in the person of a healthy young man who was going abroad to a distant part of South America where he would be far from surgical assistance and that, too, if obtained, of a very poor order. Some few months before his departure he developed a chronic mastitis but did not take any notice of it as he had no pain from it. But very shortly before he was about to leave the swelling increased somewhat and he became very much alarmed in case anything dangerous should occur to him abroad in his out-of-the-way location. I told him that there was no time for any treatment and that the gland, which was a mere rudimentary and useless affair, could be removed with the certainty of a cure in a week. The removal was done by the semilunar incision, preserving the skin, areola, and nipple so that no disfigurement resulted, and he went away feeling quite happy in his mind.

At this stage the question naturally arises, If the transition from chronic interstitial mastitis into cancer is a thing the occurrence of which is admitted by all surgeons, can we guess in what proportion it occurs? Here it seems as if statistics were of no avail whatever. What attempts have been hitherto made have lost weight by reason of the fact that they have included all kinds of mastitic trouble. Now, my contention is that the mastitis out of which, or in which, carcinoma develops is of one kind and of one kind only—viz., the chronic interstitial mastitis which arises spontaneously about the middle period of life and has nothing to do with any previous inflammatory condition. Putting aside infantile and adolescent mammary abscess the only other acute inflammatory condition which arises in the breast of moment is milk abscess. It occurs in women during the active child-bearing period between the ages of 18 and 35 years. When opened, drained, and cured all traces of inflammatory induration disappear in their sites. I have seen breasts the subjects of "rabbit warren" milk abscesses which I have literally cut in pieces which have healed so remarkably that the scars of them have been no great disfigurement, while the breast tissue has been as supple and soft as if nothing had been wrong with it. Again, in examining all kinds of female breasts for all sorts of trouble I have found the scars of incisions few and far between and of a very simple nature.

Mr. Bryant[4] says: "My own statistics tell me that out of my 360 cases of women who had borne children mastitis had occurred at some antecedent period in 80, but it is almost impossible to make out that the cancerous tumour originated at the seat of scar or induration. The tumour in the majority of cases appeared many years after the mastitis, even in one case 30 years." I cannot, therefore, agree with the statement copied from one book to another that acute milk abscesses leave behind them permanent indurations which degenerate into carcinoma or that the scars of incisions made for their relief are similarly dangerous. Chronic interstitial mastitis of the menopause—*voilà Tennemi*.

My friend and colleague Mr. F. T. Paul has long studied this question and has an unrivalled collection of specimens illustrating it. It is from his stores that the most beautiful of the specimens which I shall show you to-night have come and I hope that he will lay before the profession some day the results of his histological work. I would wish publicly to thank him for his courtesy and also my friend Dr. R. J. M. Buchanan (whose work on the Cancer Parasite will come into my next lecture) for the trouble which he has taken in arranging and preparing the lantern demonstration for to-night. Mr. Paul, like myself, while unable to fix a percentage believes most firmly that a much larger number of cases of chronic interstitial mastitis are allowed to drift into cancer than is commonly believed. The suggestion has been made and has been carried into practice by not a few surgeons that, where there is a doubt about the nature of a hard piece of chronic mastitis, the patient should be anæsthetised and that a piece of the tumour should be removed and subjected to microscopical examination. I have done this twice, but it does not seem to be a satisfactory proceeding, although theoretically it appears to be a very sensible thing to do. The truth is that what the patient dreads is chloroform and an operation of any kind. If the microscopist declares in due time that the disease is malignant then another chloroforming and another operation have to be faced. To everyone, and more especially to a woman, it is the prospect of a surgical proceeding that terrorises, and however much we may tell our patient that the removal of a small piece of her breast for examination is a mere trifle, to her it does not appear in that light, for she is no judge of the comparative severity of operations. In my first case I felt practically sure that the lump was cancerous, but the relatives were in doubt and would not allow removal until they were satisfied by the microscope that it was so. As the microscope did pronounce it cancerous the breast was duly removed and the patient had all the anxiety of the exploratory operation for nothing. In the second case the microscopic sections were so dubious in character that they were practically of no help and the diagnosis by the hand was just as good. It does not seem as if the exploratory examination will become popular. The best way is to tell the patient and her friends the true state of the case and the sources of doubt and to ask permission to proceed as you think fit on the strength of a naked-eye section made under an anæsthetic.

It is universally admitted that the essential feature of carcinoma consists in the escape of epithelium from the interior of the acini into the surrounding connective tissue and its subsequent proliferation there, this cancerous epithelium differing but slightly from the normal variety. It is clear that the ultimate reason for its proliferation must always be incomprehensible to us, involving as it does the principles of life and growth. Gland epithelium is always growing and always perishing and always being eaten up or discharged. So long as the balance between growth and waste is even there is health; when growth exceeds waste there is neoplastic disease. Apparently as soon as the epithelial cells escape from their normal habitat and get into the spaces that exist between the connective tissue fibres they increase at a great rate. Why? This is the crux of the whole question. Some hold that the irritation produced by parasitic bodies excites the growth of epithelium in ultimate alveoli or tubules and carries on the excitement when the epithelium has burst its bounds and has escaped into the cellular tissue.

In the *Journal of Pathology* of August, 1899, is detailed a very remarkable experiment by Dr. H. L. Lack. His view is that there is no necessity for such a view as a parasite and that carcinoma is simply the result of the entrance of the *normal* epithelium of the body by some means (probably traumatic) into the lymphatic spaces and its continued growth therein. The peritoneum of a rabbit was opened, the ovaries were cut open, and the milky juice from the cut surfaces was allowed to diffuse through the peritoneal cavity. An opinion was received from Professor J. McFadyean that the rabbit never developed cancer spontaneously in his experience. Thus, normal epithelium cells from a healthy animal were introduced into its own lymphatics. The rabbit remained well for nearly a year, after which it became thin and weak and suffered from dyspnœa. It was killed at the end of 14 months. White, hard, round nodules were found in the mesentery. Great masses of tumour-like tissue were found all about the thorax and abdomen, so that the spleen, kidneys, and one or two other organs were alone found to be normal. Sections showed "the typical structure of a columnar-celled carcinoma." Alluding to the fact that malignant disease of the peritoneum has been known to follow the removal of ovarian tumours, the fluid of which contains free epithelium, Dr. Lack does not admit the explanation that these tumours were necessarily malignant. Presently came a counterblast from Mr. S. G. Shattock who showed to the Pathological Society of London on Jan. 16th, 1900, a rabbit whose uteri were full of cancer, while the peritoneum contained growths also, this animal not having been the subject of any experiment. Why might this not have been the case with Dr. Lack's rabbit? He noted also that after the rupture of an ovarian dermoid multiple cysts may form in the peritoneum, but these are simple circumscribed cysts and not malignant growths such as should arise were Lack's hypothesis of the mechanical origin of carcinoma in the displacement of

[4] Diseases of the Breast.

normal epithelium into a lymph space or lymph cavity correct. In this condition we must leave the matter for the moment, acknowledging the almost startling nature of Lack's experiment but feeling that we cannot trust to a solitary example.

Let us see, then, if it be possible to trace the gradual development of a piece of carcinoma in a chronic interstitial mastitis. The earliest change probably consists in the appearance of quantities of leucocytes which constitute a round-celled infiltration distributed in the neighbourhood of the ultimate lobules. The single-layer epithelial lining of the tubules and acini which compose the ultimate lobules then begins to proliferate and grow into the interior of these cavities. At the same time there is a production of a new and very delicate connective tissue which surrounds the tubules and acini of each ultimate lobule. The normal connective tissue outside of that also increases largely in bulk, by reason of all which things many tubules are so squeezed and strangulated that, their distal portions being cut off, there is no exit for their contents, and they therefore become distended and form the innumerable little closed cysts which are found all through the cirrhotic breast of chronic mastitis. Matters may remain thus for long enough, the breast shrivelling more or less. This is the cirrhotic change already alluded to. But another change may occur. The growth of the epithelial cells in the tubules and alveoli may go on to such an extent that they become completely blocked up and appear as black areas on microscopical section. The fine interacinous connective tissue does not increase much in this case, but the ducts and acini, becoming more and more distended, eventually meet and fuse into each other. So that, in place of a number of small black areas we now see large ones, still giving slight evidences of the agglomerated acini of which they are composed. These masses of cells, however, are still held together by the surrounding interlobular tissue and by the limiting membranes of the original ducts and acini. But finally even these give way and the cells pour out into the strata of the connective tissue. They creep along between the bundles of connective tissue, following the tracts of what are probably the very earliest commencements of the lymphatic system, and rapidly reproducing themselves by the process of karyokinesis. They are now cancer cells, although between them and the original epithelial cells lining the tubules and alveoli there is not a great difference. There is certainly nothing absolutely distinctive. The normal glandular epithelial cell is of very regular shape and size and has one well-marked nucleus, being an orderly growing cell. The cancerous epithelial cell varies a good deal in size and shape, being a young, rapidly growing, erratic cell. There is some difference in the way in which certain stains affect with more or less intensity the cytoplasm of the two kinds of cells, but this is not improbably due to the difference in their age. Mr. Plimmer notices that in all actively growing cancers there is a zone of round-celled infiltration at the margin of the tumour where growth is most intense, and this zone does not exist in simple tumours. Near the more central parts of the tumour these round cells are converted into large mononuclear cells and later into fibrous tissue which surrounds the cancer cells. This stroma next causes a degeneration of the cancer cells, a digestive or phagocytic process. As time goes on the stroma hardens and serves the function of protection against invasion. So that the centre of a carcinoma is the hardest and most fibrous, and thus comes to pass the fact also that the harder the tumour—in other words, the more fibrous tumour there is in it—the less is the chance either of generalisation or recurrence. So, too, we arrive at the explanation of the atrophic cancer where the cells have been really all devoured by the connective tissue. (These changes may be seen in the accompanying plate.)

In the Transactions of the Pathological Society of London is a very interesting paper by Mr. Cecil F. Beadles which has not been accorded the prominence which it deserves. It is on certain histological changes found in association with glandular carcinoma. He examined microscopically nearly 100 breasts which had been removed for primary carcinoma. He came to the conclusion that breasts in which such tumours are found are never in what may be called a normal state. It is often possible to make out with the finger small, hard nodules situated at a distance from the tumour and having no apparent connexion with it. Sometimes, however, only slight thickenings can be felt in some parts of the breast. The acini show proliferative and other changes in the epithelium and there are to be noticed also changes in the stroma, which comes to resemble that seen in some rapidly-growing scirrhous tumours in which connective tissue-cells with their elongated nuclei run parallel around the acini, having between them what appear to be small uniform cells with round nuclei. The changes are both of the nature of chronic interstitial mastitis and, in the case especially of the thickenings and small nodules, of the nature of a condition intermediate between simple adenoma and carcinoma, extremely suggestive of commencing malignant disease. Mr. Beadles is of opinion that these changes in the apparently sound breast tissue are not produced by infection from the existing carcinoma but are most likely due to the same causes which started the tumour. Clinically and quite apart from all microscopical examination this is the opinion which I have always held myself—in plain language it means that there is a pre-cancerous state of the whole breast which, however, only blazes up into full-grown cancer at one or two points. It was this view which made me utterly disbelieve in the removal of the tumour alone and which prompted me many years ago to press vigorously upon the attention of the medical profession the advisability of free removal of the entire breast and with that the clearing out of the axilla.

EXPLANATION OF THE ILLUSTRATIONS.—CHRONIC INTERSTITIAL MASTITIS.

FIG. 1 represents chronic interstitial mastitis affecting a lobule. The lighter part with the dark area in it is a lobule. *a* shows tubules and acini of a lobule filled with proliferating cells, but they are being compressed by the growth of a young, fine, interlobular connective tissue *b*. *c* is the older interlobular connective tissue of the breast, also much hypertrophied.

FIG. 2 shows a much hypertrophied condition of the connective tissue, so that the glandular structure is almost squeezed out of existence. *a*, atrophied gland tube and acini; *b*, large duct partially filled with cells with an empty one close by; *c*, hypertrophied connective tissue. Cirrhosis.

FIG. 3 at the upper part shows ducts and acini dilated owing to their compression by connective tissue at other parts. These produce the innumerable small cysts found in chronic interstitial mastitis. *a*, dilated ducts and acini; *b*, hypertrophied connective tissue; *c*, mass of acini with others close by produced by the proliferation of epithelium dilating them to such an extent that they press against each other and practically become fused. The lower part might become dangerous in time. Cirrhosis.

FIG. 4 shows progression rather towards cancer than cirrhosis. The old interlobular connective tissue *a* is considerably hypertrophied. The centre of the figure is occupied by the greater part of a lobule. There is no great overgrowth of young interacinous connective tissue. At *b* the acini are still separate, although filled with proliferating epithelium. *c* shows a large mass of cells formed by acini which have swelled out under cell pressure, have met, and then have fused. The white holes, from which cells have dropped, evidence the sites of the former acini. The cells are still well limited.

FIG. 5 represents mastitis becoming cancerous. *a*, connective tissue; *b*, a lobule with acini filled with proliferating epithelium of which some has dropped out, not much interacinous connective tissue; *c*, masses of cells composed of fused acini still well defined; *d*, cells from a similar large mass bursting into the connective tissue and becoming cancerous at *c*. Cancer.

FIG. 6 shows mastitis become cancerous. *a*, large fused mass of acini with two neighbouring ones (the central cells have degenerated and some have fallen out); *b*, cells escaping from this mass into the surrounding connective tissue. Cancer.

NOTE ON THE CAUSATION OF CANCER.

BY SIR JAMES SAWYER, M.D., F.R.C.P. LOND., F.R.S. EDIN.,
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LIKE Sir William Banks, whose admirable lecture[1] I have read with much interest and instruction, I have been in practice about a third of a century, and, as he has done, I have been led to form some decided "impressions" as to the etiology of cancer in our midst, he forming his ideas from a surgical standpoint and I from a medical one. While statisticians, clinicians, microscopists, and medical geographers are continuing their good work in adding to our knowledge of the incidence and pathology of cancer, and while we are not quite without increasing knowledge even of its successful therapeutics, and while we await the full light which research and observation will assuredly shed some day to make plain the causes and cure of cancer, in the meanwhile the impressions of thoughtful practitioners are of the greatest value as working hypotheses in preventive

[1] THE LANCET, March 10th, 1900, p. 634.

Fig. 1.

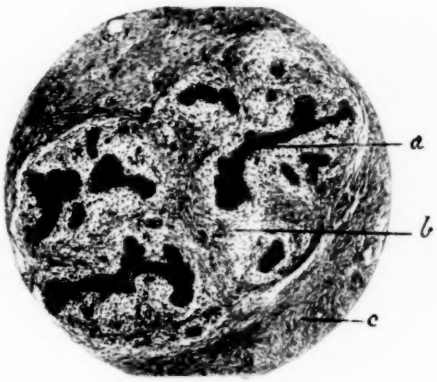


Fig. 2.

Fig. 3.

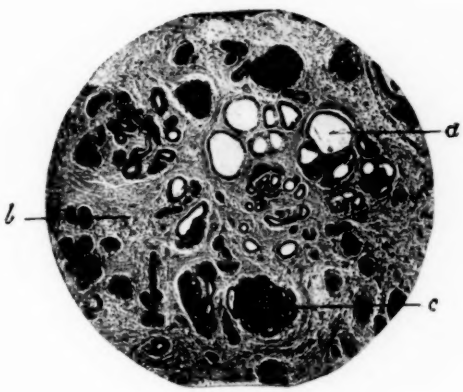
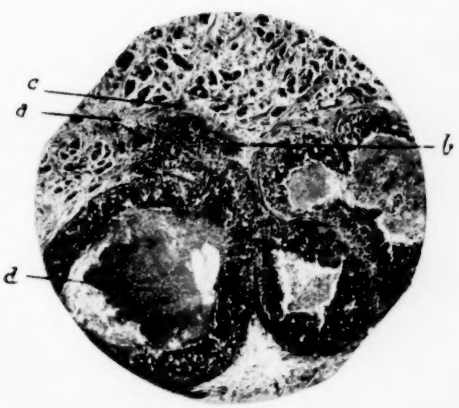


Fig. 4.

Fig. 5.

Fig. 6.



TO ILLUSTRATE THE LETTSOMIAN LECTURES ON CANCER OF THE BREAST, BY SIR WILLIAM BANKS.

practice. The probability of the truth of such impressions is strengthened when it is found that many minds arrive at the same conclusions. I have long thought that the accepted increase of cancer in England in recent years is due to the increased feeding of the population, and especially to increased feeding upon meat. It appears from the reports of the Registrar-General that the mortality from cancer in England and Wales has almost exactly doubled during the 31 years immediately preceding the year 1895. It also appears, as stated by Sir William Banks in his quotation from and summary of the figures of Mr. Haviland, that the increase in cancer mortality amongst us has risen more amongst males than amongst females. If we desire to reason by the method of concurrent variations on the causation of cancer we shall be led to inquire as to what great and widely-spread change has happened in the habits of life of the population of England and Wales during the last 30 years or so, and the fact of the enormously increased consumption of meat by the great masses of the people will be forced upon our attention. This generally increased consumption of meat has followed the continued importation of huge quantities of more or less fresh meat from America and from the antipodes. I do not mean that vegetarian feeders—if there be any who are strictly such—escape cancer. The intimate cause of cancer we do not yet know, but the malady has many of the features of a local overgrowth of tissue elements, and such appears to be favoured by excessive feeding and especially by feeding excessively and for a long time upon meat. In my experience cancer has not increased of recent years amongst the upper middle classes. In that class the general tendency seems to be towards refinement and variety of food, with the consumption of less meat and with slower and more complete cooking of meat than formerly; but for the men of the "masses" of our people meat is more a prevalent food than before, and with them meat is eaten in single dishes, in relatively large quantities, often, and undercooked. I think it likely it will be found that it is amongst the men of the masses in England and Wales that the progressive increase in cancer in the period under consideration is mainly to be found. Steam appears to have brought us cheap food, and cheap food has multiplied our cases of cancer by two.

Birmingham.

ON THE INFLUENCE OF THE TEMPERATURE OF LIQUID AIR ON BACTERIA.[1]

BY ALLAN MACFADYEN, M.D. EDIN.

THE experiments of Dr. Horace T. Brown and Mr. Escombe[2] have shown that no appreciable influence is exerted upon the germinative power of seeds when exposed for 110 hours to the temperature of liquid air (– 183° C. to – 192° C.). The results were equally negative in the recent experiments of Sir W. Thiselton-Dyer,[3] in which seeds survived exposure for upwards of six hours to the temperature of liquid hydrogen (– 250° C. to – 252° C.).

The following investigation on the influence of the temperature of liquid air on bacteria was carried out at the suggestion of Sir James Crichton Browne and Professor Dewar. The necessary facilities were most kindly given at the Royal Institution. The experiments were conducted under the personal supervision of Professor Dewar and he has asked me to put the results on record, although it must be acknowledged that the essential features of the investigation are due to him. The bacteria employed were selected from the stock of the Jenner Institute of Preventive Medicine, where the results were also controlled. Pure cultures of the several micro-organisms were employed and the series included typical representatives of saprophytic and parasitic bacteria. The organisms chosen possessed varying degrees of resistance to external agents—the extremes in this respect being represented by the very sensitive spirillum of cholera Asiatica and the highly resistant spores of bacillus anthracis. Ten organisms were used for the experiments—viz., bacillus typhosus, bacillus coli communis, bacillus diphtheriæ, spirillum choleræ Asiaticæ, bacillus proteus vulgaris, bacillus acidi lactici, bacillus anthracis (sporing culture), staphylococcus pyogenes aureus, bacillus phosphorescens, and photobacterium balticum. The cultures of the organisms were young and vigorous and were tested both on solid and in fluid media—viz., nutrient gelatin, agar-agar, potato, and peptone broth. The cultures on these media were simultaneously exposed to the temperature of liquid air for 20 hours (– 182° C. to – 190° C.). They were then carefully thawed and examined. The results may be briefly stated. In no instance, whether on solid or in liquid media, could any impairment of the vitality of the micro-organisms be detected. The fresh growths obtained from the exposed tubes were normal in every respect, and the functional activities of the bacteria were equally unaffected. The colon bacillus produced its typical effects—such as the curdling of milk, the fermentation of sugar, and the production of indol; the staphylococcus pyogenes aureus retained its pigment-producing properties and the anthrax spores their pathogenic action on animals. The photogenic bacteria preserved their normal luminous properties. These photogenic properties are intimately connected with the functional activities of the cells. The cells emit light which is apparently produced by a chemical process of intracellular oxidation and the phenomenon ceases with the cessation of their activity. These organisms therefore furnished a very happy test of the influence of low temperatures on vital phenomena. Their cultures, when cooled down in the liquid air for 20 hours, became non-luminous, but on re-thawing the luminosity returned with unimpaired vigour as the cells renewed their activity. Watery emulsions of the photogenic bacteria, on immersion in liquid air for a few minutes, ceased to emit light, but on withdrawal the luminosity re-appeared in a very short time. Strips of filter paper soaked in the watery emulsion and brightly luminous were immersed directly in the liquid air with similar results. The sudden cessation and rapid renewal of the photogenic properties of the cells, despite the extreme changes of temperature, were remarkable and striking.

The following experiment was made:—50 litres of the laboratory air about six feet from the ground were liquefied at atmospheric pressure in a glass bulb by means of boiling liquid air *in vacuo*. The temperature reached was about – 210° C. The bulb was then sealed off, the contents being still at a temperature below zero, and was subsequently opened and washed out with sterile broth. A series of plate cultures were made from the broth on nutrient gelatin, agar-agar, and sugar agar, and were incubated under aerobic and anaerobic conditions at 22° and 37° C. for a period of ten days. The anaerobic plate cultures remained sterile. The aerobic plates yielded 44 organisms which had survived an exposure to – 210° C. The organisms were representative types of those to be usually met with in the air—viz., moulds, bacilli, cocci, torulæ and sarcinæ. It may also be mentioned that a sample of yeast cell plasma (Buchner's zymase) subjected to a temperature of from – 182° C. to – 190° C. for 20 hours retained its peculiar properties unchanged—viz., as regards the production of CO_2 and alcohol.

The above experiments show that bacteria may be cooled down to – 190° C. for a period of 20 hours without losing any of their vital properties. Further experiments are in progress with the above-mentioned, and with other micro-organisms exposed to the temperature of liquid air for still longer periods of time, as well as to that of liquid hydrogen. These experiments will form the subject of a future communication.

Chelsea, S.W.

[1] A paper read before the Royal Society on Feb. 1st, 1900. Communicated by Lord Lister, Pres. R.S.

[2] Proceedings of the Royal Society, vol. lxii., 1898, p. 160.

[3] Ibid., vol. lxv., 1899, p. 361.

ROYAL INSTITUTION.—The Friday evening discourse at the Royal Institution on March 16th was delivered by Sir Benjamin Stone, M.P., the founder and president of the National Photographic Record Association. The discourse was on the subject of Pictorial Historical Records and was illustrated by a large number of lantern slides showing views in Windsor, in Windsor Castle, and in the Tower of London, and antiquities in the Record Office. Modern survivals of ancient customs were also represented, such as well-dressing in Derbyshire, horn dance (with reindeer horns) at Abbot's Bromley in Staffordshire, mop or statute fair at Stratford-on-Avon, and the payment of "wroth money" to the Duke of Buccleuch on St. Martin's Day in Warwickshire

PHOSPHATIC DIABETES.

BY GUTHRIE RANKIN, M.D. GLASG., M.R.C.P. LOND.,
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THE demonstrable presence of phosphates in the urine is a clinical fact with which we are so familiar and which in its more usual manifestations is apparently of such little importance that we are apt to neglect it entirely as being an element of no more than passing and trivial interest. Phosphorus is essential for the growth and nutrition of the tissues, but the physiological part which it plays in the processes of metabolism is still imperfectly understood. It exists in a neutral form in the blood and is eliminated as a normal constituent of urine in the proportion of 1 part per 1000. The average daily excretion ought to amount to from 35 to 50 grains. It appears in the urine in three principal varieties:—1. The phosphates of potassium and sodium—the acid phosphates—are the chief cause of the acidity of the urine. They are extremely soluble and never form any part of the phosphatic deposit so frequently met with. 2. The phosphates of magnesium and calcium—the earthy phosphates—form about one-third of the whole normal phosphatic constituent of the urine; they are much less soluble than the acid phosphates and are precipitated if in excess on boiling or when the urine becomes neutral or alkaline. 3. Triple phosphates. These salts are formed by the combination of magnesium phosphate with carbonate of ammonia. The only source of ammonia is urea and therefore triple phosphates can only be found in urine which has undergone decomposition.

The occasional presence of phosphates which only become manifest on boiling the urine is not properly understood but is believed to be frequently concerned with undue wear and tear of the nervous system. The condition is not serious and disappears under the influence of rest combined with suitable tonic and dietetic treatment. The persistent presence of phosphates which appear spontaneously as a more or less dense cloud in undecomposed urine of neutral or alkaline reaction is the rarest form of phosphaturia, but is also one which must be looked at suspiciously as capable of mischief. In this connexion it must be remembered that a spontaneous deposit of earthy phosphates in the urine is not necessarily evidence of their excess, because when normal urine becomes alkaline a deposit of phosphates may take place even when the amount of phosphorus eliminated is within physiological limits. Indeed, it has been frequently pointed out, first by Bence Jones and subsequently by others, that after the principal meals of the day the urine may become neutral if the character of the meal has been such as to lead to the formation in the intestines of large quantities of carbonates. The presence of triple phosphates at the time of, or immediately after, micturition is always indicative of local mischief in the urinary tract somewhere. All phosphatic deposits are at once dissolved by acetic acid and are thus distinguished from other forms of urinary precipitate.

The clinical importance of phosphaturia varies according to the chemical variety which the phosphorus presents in the urine. The temporary variety where the phosphatic salts are amorphous is not of present importance, nor is the local disorder which results in the production of the triple form of deposit; but the third variety in which the urine contains a deposit amounting, it may be, to a third or more of its whole bulk of stellar crystals of phosphate of lime is full of interest, not only because it is little understood, but also because it is rare and not infrequently fatal. In cases of this type the phosphates are present permanently in excess, but periodically the daily average of the amorphous salts is increased by a more or less copious shower of stellar crystals. The patient complains of thirst, polyuria, and languor. In cases where there is an increase of the urea as well as of the phosphorus emaciation may become a feature. The urine is of low specific gravity and contains neither albumin nor until the later stages sugar; often not then. This form of phosphaturia was first called attention to by Tessier of Lyons in 1877 under the designation of "*diabète phosphatique*." It is usually met with either in young adults of neurotic heredity or in men at middle life who have lived freely, curtailed themselves of the requisite amount of sleep and relaxation, and pursued brain work under conditions where exercise was neglected and open air treated as a luxury. The disease may run a course symptomatically resembling diabetes mellitus but without sugar in the urine; or it may alternate with true diabetes, there being at some times an excess of phosphates and no sugar and at others sugar but no remarkable excess of phosphates. The initial polyuria may excite suspicion in the patient's mind and lead him to see his medical adviser, but if the case be one in which no sugar is found on application of the usual tests it is apt, and very naturally, to be looked upon as trifling and as wholly explained by a passing condition of nerve or digestive disturbance. Especially is this likely to happen if the urine chances to be examined at a time when the phosphates are only present in the amorphous form. As time goes on the patient's thirst increases, he is conscious of progressive failure of his general vigour, and not infrequently he is annoyed and puzzled by an unreasonable irritability of temper which is new to him. Neuralgia is a source of much misery in some cases, and may attack any nerve, but is specially prone to invade the branches of the trigeminal or facial; in others, the prevailing discomfort is a liability to recurring attacks of unaccountable drowsiness which no effort of will-power can shake off. When emaciation ensues there is always risk of the onset of phthisis.

Such is a short outline of the usual sequence of events in this variety of phosphaturia, and it is related to elucidate the following case which was recently under the writer's observation.

The patient was a medical man who had suffered for some years from kidney colic and had on more than one occasion passed a small uric acid calculus. He was of full habit, lived well, worked very hard, and abstained from every form of exercise. In the month of August he wrote to me: "Doubtless you are familiar with urinary deposits, but did you ever hear of a urinary scum? I have one, and I want to know all that is known about it, for it is attended with a remarkable symptom—sleepiness, not drowsiness, but prolonged, sound, pleasant sleep lasting for 12 or 14 hours. I have it about every six or eight weeks and there is positively no other symptom. I know exactly when I shall get it and as I slept last night and the night before nearly 12 hours each I knew I should have it this morning, and it is better marked than I ever saw it—quite a thick scum, so that I caught it easily on a slide. At first it is quite transparent and in an hour or so it glistens or iridesces on the top of the urine like oil, then solidifies like fat, just as you see it on the enclosed slide. At these times I have about from 100 to 110 ounces of urine in 24 hours, alkaline, with a specific gravity of from 1010 to 1018, and containing abundant phosphates. I have had chronic phosphaturia for some years, but cannot find out that it means anything." The deposit on the slide consisted almost wholly of stellar phosphates, with which were associated a few epithelial cells and one or two renal casts. A sample of urine was analysed two days after the receipt of the above letter and was found to possess a specific gravity of 1017 and to be neutral in reaction. It contained a trace of mucin, a haze of albumin, and an excess of uric and phosphoric acids, but no sugar.

At a later period this gentlemen again wrote to me: "No alteration occurred in my condition for several months, but I then had occasion to visit P——, and when there paid a visit to a farm owned by the gentleman who was my host. In the farm kitchen I saw some butter-milk and tasted it. A craze of the most extraordinary kind seized me at once—a feeling as if I could not do without it. I drank nearly three gallons that day and two the next, and so on as long as I could get it. I now travel with a quantity of it always and drink never less than two quarts a day, but without the intolerable longing for it. That has disappeared a month ago and so have the phosphates *absolutely*. I still have the abrupt violent polyuria as I have all my life. I have not gained in weight with the butter-milk. During the craze I often took no solid food for 20 or 30 hours." This condition of apparent improvement continued till the following April when he again wrote: "I have but ill news to give you of myself. Three weeks ago the phosphaturia came back, has increased to an extent it never has reached before, and the butter-milk is no good. My bladder is getting irritable and I evacuate every three or four ounces, often much less, with great heat and straining every time at the neck." At this date the urine analysis recorded an alkaline

reaction, a specific gravity of 1015, a minute trace of albumin, no sugar, a large deposit of amorphous and triple phosphates, and some epithelial cells. A subsequent acute attack of renal colic was the prelude to a short illness in the course of which he had much trouble with his bladder, and which terminated fatally from sudden and unexpected coma.

The details of this case are so interesting and the record of symptoms is so graphic that I hope no apology is necessary for the length of the extracts which I have quoted. The entire disappearance of phosphaturia during the time he was taking butter-milk suggests that the acids which it contains so abundantly had probably something to do with neutralising the excess of phosphates, and if this be so it raises the question whether the large quantities of butter-milk which during his craze he was tempted to drink does not convey a hint that in the use of acids in ordinary forms of neutral or alkaline phosphatic urine we perhaps err in dealing with inadequate doses.

The presence of triple phosphates in the last analysis and the co-existence of pain, heat, and straining on micturition too clearly showed that the bladder had become the seat of a calculus, most probably a rapidly accumulating mass of phosphates outside a uric acid nucleus. He died comatose and this could hardly be ascribed to the condition of either his bladder or kidney. It more closely resembled the coma so often met with in diabetes mellitus. The urine was persistently excessive in quantity but it never contained sugar. If the uric acid element in this case be left out the picture of Tessier's phosphatic diabetes is almost complete. Most of the leading features of ordinary diabetes present themselves but the urine contains as its abnormal constituent an excess of phosphates instead of sugar.

Cases of this disorder are rare, but their diagnosis is easy if due attention is given to the urine, which is always neutral or alkaline in reaction, excessive in amount, usually of low specific gravity, and loaded with phosphates often of the stellar variety. The diseases with which it is most liable to be confused are diabetes mellitus, diabetes insipidus, and chronic interstitial nephritis. The urine of diabetes mellitus contains sugar and that of interstitial nephritis albumin, so that in straightforward cases either may be readily distinguished from the urine of phosphaturia. The latter condition, however, may occur in association with either or both of the former, when the urine will be found to contain phosphates, together with sugar or albumin, or with both.

The effect upon the general health tends to be ultimately serious and the prognosis should always be guarded. The occurrence of attacks of drowsiness, the onset of emaciation, the alternation of sugar with stellar phosphates, or a permanent increase in the urea excretion are the more important points which add to the gravity of the prognosis.

Treatment is summed up, according to Ralfe, in rest and improvement of the general nutrition. Drugs seem to be of little avail in checking the undue excretion of phosphates; even opium, which is of such value in true diabetes, has no effect and is, on account of the tendency to drowsiness, not altogether free from risk. Butter-milk may be added to the daily dietary and will be found of considerable nutritive value. This case suggests that it may also possess some direct power over phosphates when these are present in marked excess.

Chesham-street, Belgrave-square, S.W.

CLERICAL, MEDICAL, AND GENERAL LIFE ASSURANCE SOCIETY.—The report of this society for the year ended June 30th, 1899, shows that the new assurances consisted of 810 policies, assuring £641,353, and yielding in annual premiums £21,797. Re-assurances were effected to the extent of £46,000, with annual premiums of £1741. The net new business of the year was therefore £595,353 in sums assured, yielding annual premiums of £20,056. The total premium income was £293,773, showing an increase of £5448 over last year, and the whole income of the society was raised from £422,006 to £431,776. The claims arising from the death of 235 persons, assured under 299 policies, were for the aggregate amount of £239,897. The excess of revenue over all expenditure amounted to no less than £106,900 and raised the assurance fund at the close of the year to £3,590,305. Three vacancies occurred in the board of directors caused by the death of Sir John Mowbray (the chairman) and the resignation of Lord Curzon and Lord Lister. Sir Thomas Smith, F.R.C.S. Eng., was elected in Lord Lister's place.

A CASE OF IRREDUCIBLE DISLOCATION AT THE ELBOW.

BY R. HAMILTON RUSSELL, F.R.C.S. ENG.,
SURGEON TO THE MELBOURNE HOSPITAL FOR SICK CHILDREN.

ON June 27th last a little boy, aged eight years, while playing at football fell with the left arm twisted under him and sustained a dislocation of both bones of the forearm backwards at the elbow. He was attended by Dr. Loosli of this city, who was at once struck by certain peculiarities in the case; he also found that all efforts at reduction, even under chloroform, were of no avail, and asked me to see the patient with him.

On examination the fact of dislocation backwards of both bones was very obvious, but there were unusual features which, as the accident is one that, so far as I can ascertain, is now recorded for the first time, I will describe with some minuteness. First, the arm was markedly straighter than usual—so nearly straight, in fact, that it had been found possible to put the limb up somewhat loosely in straight cardboard splints; secondly, there was an absence of the usual marked fixity of the arm, so that the forearm could be moved through a considerable angle but could hardly be made to approach so near to a right angle with the humerus as is usual in such a dislocation; thirdly, on attempting reduction, the sensation imparted to me was quite novel: the forearm yielded to the pull quite easily, and the deformity could be very nearly reduced but not quite, while directly the force was withdrawn the bones sprang back into their false position with a kind of elastic rebound. There was also occasional slight crepitus. I was unable at the time to make a correct diagnosis of the exact anatomical nature of the injury which produced these phenomena, but I advised, with Dr. Loosli's concurrence, an operation which was undertaken the next day.

Through a longitudinal incision over the extensor aspect of the joint the triceps and aponeurotic investment of the joints were divided and the interior of the articulation was exposed to view. It was then found that the interior was occupied by a mass of muscle which further investigation made evident as the brachialis anticus. The internal epicondyle was separated, which explained the slight crepitus during examination. The humerus at the time of the injury had pushed its way through the anterior ligament of the joint and passing to the outer side of the brachialis anticus had become lodged on the front of that muscle; so that when viewed through the operation wound the muscle lay strapped over the back of the lower end of the humerus and pinched tightly between that bone and the coronoid process of the ulna. It was necessary to divide a portion of the displaced muscle, and when that was done a strong curved spatula was passed between the remainder of the muscle and the bone and the humerus was easily pulled into place. The divided triceps was then sutured, the skin wound was completely closed, and the arm was put up straight in a stiff bandage. Six days later the bandage was taken off for the removal of the stitches. The wound was quite healed, and the little boy was able to bend his arm without assistance to near the right angle, in which position it was put up again in plaster-of-Paris for a further fortnight. Three weeks from the operation all apparatus was removed, but the child was directed to wear a sling for one week more, with permission, however, to take the arm out to use it when so inclined, but to return it to the sling when not using it; this was out of consideration for the partially divided brachialis anticus muscle. No passive motion was performed, although the elbow remained very stiff for some weeks. When last seen, five months after the accident, however, the movement had all returned and the result was perfect as to the utility of the arm, but on close inspection during flexion of the arm I had reason to think that the brachialis anticus had never completely recovered and that the other muscles passing from the condyles to the forearm and wrist were called upon for a somewhat larger share than usual in the production of flexion at the elbow. This seemed, however, to make no difference, as the child was able to play cricket and other games, and there was no perceptible weakness or defect in the limb.

Melbourne.

A Mirror
OF
HOSPITAL PRACTICE,
BRITISH AND FOREIGN.

Nulla autem est alia pro certo noscendi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum tum proprias collectas habere, et inter se comparare.—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv. Proœmium.

HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET.

A CASE OF CHRONIC INTESTINAL OBSTRUCTION; NECROPSY.

(Under the care of Dr. D. B. LEES.)

INTESTINAL obstruction is a rare but very important complication of appendicitis. It is specially likely to occur in cases in which localised abscesses have formed and Hawkins[1] describes four deaths as due to this cause in ten fatal cases of local abscess; these are generally acute cases. Obstruction of the intestine, when chronic in character, if due to appendicitis, is more likely to result from matting together of the bowel[2] as in the case recorded below. In this instance it is not improbable that tuberculous disease of the appendix was the cause of the adhesions. Fitz[3] met with eight cases of perforation of the appendix resulting from tuberculosis in 257 cases of appendicitis. For the notes of the case we are indebted to Dr. Hugh Thursfield, medical registrar and pathologist.

A boy, aged two and a half years, was admitted into the Hospital for Sick Children, Great Ormond-street, under the care of Dr. D. B. Lees, at the end of June, 1899. He was brought to the hospital on account of constipation and was treated in the out-patient department. The constipation was followed by a bad attack of diarrhœa for which he was made an in-patient. The history given by his mother was that till the age of 18 months he was a healthy child, but he then began to suffer from attacks of diarrhœa. Three months later his stomach was noticed to be getting larger and the diarrhœa was now accompanied by abdominal pain. He was treated by a medical man and improved, but about Easter, 1899, he began to have attacks of abdominal pain in which the stomach was, as his mother said, "drawn up in cords." He twice passed blood by the rectum and vomited dark-brown fluid. He went to the country and improved for a time, but the abdominal troubles recurred and he was taken to the hospital. As well as could be ascertained the family history and the surroundings of the child were fairly good, though his mother's father was stated to have died from "consumption."

On admission the child was very thin and fretful but had no fever and at first no diarrhœa; his appetite was fairly good and he did not appear to be very ill. The heart and lungs were apparently sound, but the abdomen was enlarged; there was visible peristalsis, and on the right side rather low down there was a mass which felt like a mass of enlarged glands. From time to time this mass could be felt in slightly different positions, the most constant being just to the right of, and below, the umbilicus. At first the child improved greatly, but at the end of July diarrhœa with some fever set in and he began to lose ground. The motions were pale, slimy, and drab-coloured. There was never any blood. In August and September he had several severe attacks of abdominal pain, which were accompanied by visible peristalsis, the small intestines being especially concerned. The diagnosis lay between enlarged tuberculous glands with matting together of coils of intestine and a chronic intussusception of the bowel. In the hope of relieving the obstruction laparotomy was performed by Mr. T. H. Kellock on Sept. 28th. He felt some large glands and saw a few yellow tubercles on the peritoneum; some adherent coils of intestine were separated and a small band of fibrous tissue was divided. After the operation the child was completely relieved of the attacks of abdominal pain but his condition otherwise remained unaltered. The diarrhœa recurred, he began to have an intermittent temperature, and gradually sank, and died on Oct. 12th.

[1] Diseases of the Vermiform Appendix, p. 94.
[2] Mynter: Appendicitis, p. 89.
[3] American Journal of the Medical Sciences, October, 1888.

Necropsy.—The post-mortem examination was made 48 hours after death. In the head and thorax no abnormal condition was observed. On the parietal peritoneum in a few places there were small scattered granular tubercles but no general tuberculous peritonitis was present. On the right side the liver was bound to the abdominal wall by dense adhesions. The lowest part of its right lobe was involved in a mass which consisted of liver, intestine, peritoneum, and mesentery and they were so bound together that even careful dissection could scarcely separate the various parts. This mass lay to the right of, and rather below, the umbilicus, lying, in fact, over the lower half of the right kidney. On dissecting the mass the appendix was found lying in a line pointing vertically upwards behind the colon. Its tip, however, on the inner side of the colon was adherent to the lowest part of the right lobe of the liver; and matted round this point were loops of small intestine, the mesentery, the ascending colon, and several large glands, in one of which there was a caseous focus. In two places at least there was a fistulous communication between the appendix and the small intestine which was much ulcerated. The ascending colon showed very little ulceration and no fistula was found. On opening the loop of small intestine two small brownish bodies fell out which resembled the kernel of some fruit, such as an apricot. The small intestine above the portion involved in the tumour had its walls remarkably thickened and hypertrophied. The descending colon was the site of very numerous small ulcerations, some of which showed tubercles on the peritoneal surface, and all were transverse to the gut and had edges slightly raised and much undermined. The lowest portion of the sigmoid flexure was caught up and fixed by strong adhesions to the tumour above. The spleen showed a few granular tubercles and one small caseous patch. The mesenteric glands were rather larger than normal and in one of these there was a focus of caseation, but no mass of large glands was found. The glands elsewhere were normal.

Remarks by Dr. LEES.—An accurate diagnosis of this case may fairly be said to have been impossible. The mass felt on admission was thought to be composed of caseous glands and intestine matted together by a chronic tuberculous process. The history given by the mother seemed to be in accord with this view, the blood passed on two occasions per rectum and the diarrhœa being ascribed to tuberculous ulcerations of the bowel. The attacks of abdominal pain and the visible peristalsis were ascribed to the obstruction caused by the implication of the intestine in the mass which could be felt. But when the peristalsis became extreme, coils of small intestine pushing forward the abdominal wall in prominent ridges during the attacks of pain, it was determined to try whether any relief could be given by operation. The laparotomy revealed adherent intestine, enlarged glands, and some tubercle. As much separation of the adhesions was effected as seemed possible without incurring the risk of rupture of the bowel. But the facts that a coil of small intestine was adherent to a diseased appendix vermiformis, with two communications into it, that the tip of the appendix was adherent to the liver, and that the adherent bowel contained two foreign bodies, were revealed only by the necropsy. It may be added that the foreign bodies were precisely similar to one another, being oval in shape and quite unlike the "fæcal concretions" which often perforate the appendix.

Remarks by Dr. THURSFIELD.—Pathologically the points of interest seem to me to be the unusual position of the appendix and the question of the sequence of events—that is, whether the tuberculous infection preceded and determined the formation of the adhesions between the liver and appendix or whether the tuberculous infection took place in a part of the intestine which was already the seat of inflammation. I do not think that it is possible to advance beyond speculation, but probability appears to me to point to the first solution. The presence of the foreign bodies I regard as accidental and quite recent.

BEDFORD COUNTY HOSPITAL.

A CASE OF SUPPURATIVE APPENDICITIS WITH SECONDARY LIVER ABSCESSES.

(Under the care of Mr. W. GIFFORD NASH.)

ABSCESS of the liver occurring in the course of appendicitis is nearly always the result of a septic thrombosis or of a pylephlebitis, but, as in the case here recorded, it may

be due to direct extension of the suppuration. Hepatic abscess was present in 11 out of 257 cases published by Fitz,[1] Hawkins met with one case in 38 cases of appendicitis,[2] and Mynter[3] saw one case in 75 cases. For the notes of the following case we are indebted to Mr. F. H. Allfrey, house surgeon.

A boy, aged 15 years, was admitted into the Bedford County Hospital on Sept. 27th, 1899, with abdominal pain and high temperature. He had been in gaol for some weeks and on Sept. 12th Mr. Nash had been called in because the patient had some diffuse abdominal pain. On the next day the pain was chiefly in the right iliac fossa and vomiting had occurred five times, but there was no rise of temperature. On the 14th there were tenderness and increased resistance in the right fossa; the temperature was normal, but during that night he shivered. On the next day the tenderness was very marked; the bowels were opened after a small dose of castor-oil. The morning temperature was 103° F. and the pulse was 108. On the 16th he was sick once; the temperature was 102° in morning and rose to 103° at night. For the next three days he seemed better, the temperature remained down, and the pain was less; except for some tenderness there was nothing to be felt in the right fossa, and the percussion note was resonant. On the 20th the patient sweated during the night and the temperature again rose to 101°; the bowels were not open; the tongue, which had been thickly coated, was cleaner. During the next four days the temperature rose to 102° at night; sweating was noticed at times; the bowels were open several times, the motions being loose on the 23rd. On the 25th increased resistance was felt over the ascending colon. While in gaol he was treated with small doses of calomel and with sodium salicylate and bismuth.

When admitted to the hospital on Sept. 27th the boy looked ill and complained of general abdominal pain. Nothing abnormal was found in the chest except that the liver dulness in the mid-axillary line began at the upper border of the seventh rib. The abdomen moved slightly all over; no prominence or fulness was to be seen. Slight tenderness was complained of on firm pressure in the right iliac fossa; the right half of the abdomen was slightly more resistant than the left. No tumour could be felt in the appendix region, but beneath the right costal margin was a firm swelling extending about two inches from the ribs; it felt like liver, but did not move on respiration. The abdomen was everywhere resonant except over this area in the right hypochondrium. The tongue was thickly coated, the pulse was small and rapid, and the temperature was 103°. A simple enema was given with good result. On the 28th the temperature, which was 103° at 2 A.M., fell to 96° at 6 A.M. The patient passed a fairly good night but sweated freely.

On Sept. 29th Mr. Nash operated. An incision was made from the right linea semilunaris about an inch above the crest of the ilium to the mid-axillary line; at the hinder end of this wound pus was seen flowing from behind the colon. A cavity was opened up extending upwards and downwards, and a concretion of the size of a large pea was felt in and removed from the lower part of the abscess cavity behind the cæcum. The pus had a strong fæcal odour and contained fæcal matter. On irrigating the cavity with 1 in 2000 perchloride of mercury solution a slough about four inches long came away, which proved to be the remains of the appendix. The cavity was plugged and the wound was left open. About an hour after the operation the temperature rose to 105° and the patient had a rigor lasting several minutes. For two days the temperature ranged from 98° to 104°, the sweats and rigors continued, and the pulse averaged 108 and respirations 26. Quinine was given every four hours. On Oct. 2nd the patient became rapidly worse; the wound showed no sign of repair, being covered with a green slough, and there was no discharge from the abscess cavity; the respirations rose to 40 and the pulse to 140. He died the next morning, five days after operation and 21 days from the onset of the symptoms.

Necropsy.—Post mortem there was no sign of general peritonitis, but, extending upwards from the cæcum behind the colon was an abscess cavity between the layers of the mesocolon; the mesocolon at the hepatic flexure was adherent to the liver, and on separating these adhesions the under surface of the liver was found to be rough and ulcerated. A section through the portion of liver in the neighbourhood showed numerous abscess cavities, the largest having a diameter of about half an inch. The stump of the appendix, about an inch in length, was found lying curled upwards behind the ileum. About two inches above the ileo-cæcal valve on the posterior surface of the colon was another perforation leading into the abscess cavity. There were three suppurating retro-peritoneal lymphatic glands.

Remarks by Mr. ALLFREY.—The most noticeable fact about the case was the absence of physical signs, but this is accounted for by the course which the pus took behind the colon. An operation in gaol could not be easily managed, and even after the patient's admission into hospital there was some doubt as to where to operate in the absence of any swelling or dulness. It is possible that the temporary improvement after Sept. 17th was due to the discharge of the pus into the colon through the second perforation. The abscesses in the liver were evidently due to direct infection from the original abscess cavity and not the result of infection by the portal system, for they were confined to the region of the impressio colica. It is quite possible that if an early operation had been performed the result would have been different, for the pus would then have been liberated before it had reached the liver.

[1] American Journal of the Medical Sciences, 1886.
[2] On Diseases of the Vermiform Appendix, p. 97.
[3] Appendicitis and its Surgical Treatment, p. 90.

Medical Societies.

PATHOLOGICAL SOCIETY OF LONDON.

Forms and Significance of Proteids in the Urine.

A MEETING of this society was held on March 20th, Mr. A. PEARCE GOULD, the acting President, being in the chair.

Dr. T. G. BRODIE resumed the debate on the Forms and Significance of the Proteids met with in the Urine. He fully endorsed Professor W. D. Halliburton's explanation of why serum albumin was usually more abundant than the globulin. It was largely a question of the relative size of the two molecules. When a simple proteid solution was filtered through ordinary filtering-paper the resulting solution became weaker and this weakening of the solution by filtration was more marked in the case of globulin than serum albumin. He then proceeded to describe some experiments which tended to explain the variations observed in the nature of the proteid present in cases of albuminuria. In the first place he instanced the evidence gained by filtration. All experiments tended to show that the albumin molecule was of smaller size than that of the globulin, that a filter having finer pores was necessary to hold back albumin molecules than one which completely prevented the passage of globulin. In the next place he described the results as to the artificial production of albuminuria when the excised kidneys of an animal were kept alive by perfusion of defibrinated blood through them. In these cases it was found that at first the urine was often proteid-free. In a short time, however, hæmoglobin made its appearance. Later—i.e., in about two hours' time—the urine contained a considerable quantity of proteid which was found to be chiefly serum albumin, only a very small quantity of globulin being present. In another series of experiments he used dead kidneys, injecting various hardening reagents (commencing with warm methylated spirit) to keep the renal tissues *in situ* and intact. Starting from these and similar points he argued that the usual variation in the nature of the proteid could to a great extent receive an explanation based upon the physical conditions of filtration present and the different size of the molecules of the various forms of proteid. Turning to the clinical aspect of the question he had found that in the renal disorder attending cardiac disease the proteids in the urine were pretty much in the same proportion as they existed in the blood. In large white kidney and the granular contracted kidney there was mostly very little globulin compared with the albumin in the urine.

Mr. P. J. CAMMIDGE (Leeds) read a paper entitled Some Observations on the Proteids Excreted in Albuminuria. After describing the method he had employed in separating the proteids from the urine, he exhibited charts of the excretion of total proteids, serum albumin and serum globulin, in eight cases of albuminuria. These included cases of acute

and chronic Bright's disease, amyloid disease, albuminuria of pregnancy, and eclampsia. He then made some remarks on these cases and pointed out that, as a rule, the most marked variations in amount took place in the serum albumin, the serum globulin being more constant, but that when the serum globulin did show marked variations the case tended to be more severe. He had examined altogether 198 specimens of albuminous urine taken from 28 cases. It would not, he thought, be right to draw any general rules from these, but the facts certainly had some bearing on prognosis and tended to show in the first place that the amount of the albumin in any given specimen of urine alone was not a safe guide as to the severity of the case. The total proteids in the 24 hours was, however, a better guide; but he regarded the presence and the amount of serum globulin as the most important indication of the extent of the disease of the kidney itself. Marked rises and falls in the amount of globulin seemed to indicate the probable approach of a fatal issue.

Dr. F. G. HOPKINS (Cambridge) said he would confine his remarks to a case of physiological albuminuria which he had observed in a man aged 21 years. This man habitually passed small quantities of albumin. The albuminuria was closely related to diet—i.e., it only occurred three or four hours after a meal. The amount was small, never exceeding from one and a half to two parts per 1000. The curious part of the case was that the proteid that was passed was not always the same. It was always some form of albumin, but on at least one occasion, when he was confined to a diet of bread and milk, the proteid when separated by coagulation was found to contain no loosely combined sulphur, as it did when he was on ordinary animal diet. The patient was preparing for an examination and he (Dr. Hopkins) did not like to try the effects of different dietaries; but the facts elicited seemed to show how important it was in such cases to examine carefully the nature and quality of the proteid substance excreted. Such cases induced him to turn his attention to the intestines and the processes going on there. The intestines had to deal with, to disintegrate, and to build up by a process of synthesis, many different kinds of proteids from many different kinds of materials taken into the body in the form of food. He thought that much could be learned from an attentive study of cases of physiological albuminuria.

Dr. W. LEE DICKINSON wished to confine his remarks to the clinical aspect of the question which he admitted was less precise than the laboratory results. His remarks would refer chiefly to the peptones or albumoses, and particularly that form known as hetero-albuminose, by which he wished to indicate a collection of bodies, amongst them Bence Jones's albumin, very like to each other, their common feature being coagulation at a low heat and re-solution at a higher one. The presence of these substances in the urine was not only associated with diseased bones, but had also been found with glycosuria, with myxœdema (by an American physician), and with leucocythæmia (of which he had met with one case). This kind of albuminosuria was always followed by death in the course of a few months. More ordinary kinds of albuminosuria or peptonuria had been described in connexion with measles, scarlet fever, typhoid fever, scurvy, the puerperal state, rheumatism, and cerebro-spinal meningitis. This change in the urine was also found in cases marked by suppuration or extensive inflammatory exudation, especially pneumonia and empyema. In observations made some years ago, among the class of cases usually found in the wards of a general hospital, he had found it limited to these two last-named diseases, and especially in severe cases a few days after inception, when the amount of peptone might be very large, in some cases reaching as high as 1 per cent. A rough examination might fail to find it in other cases. The best test was the cold nitric acid and biuret test, which required considerable care in the proportion of the reagents. Peptonuria was not an infallible evidence of suppuration; it had also been met with in fibrinous pleurisy and in purulent bronchitis. It only indicated extensive and severe inflammation with the formation of proteolytic products. It also indicated excretive activity in the kidneys. It was less frequent, he believed, than formerly. It seemed to be absent from abdominal inflammations, with the exception of an abscess bursting into the peritoneal cavity.

Dr. ARCHIBALD E GARROD referred to certain circumstances attending paroxysmal hæmoglobinuria. Formerly this process was looked upon as the turning out of a foreign proteid, but from Dr. Brodie's observations it followed that the kidneys were not able to keep back hæmoglobin, or only in very small quantity. As regards what might be termed "foreign" albumins they seemed to be thrown out very readily. Egg albumin, for instance, if taken raw in very large quantities appeared in the urine, and he referred to a case in point. In reference to the general question of albuminuria perhaps in some cases the proteid itself was at fault, the albuminuria being due to a kind of "chemical malformation" in the individual.

Dr. F. PARKES WEBER alluded to the frequent obvious presence in clear urines (generally of extremely low specific gravity) of what he believed to be a trace of mucin (nucleo-albumin). He likewise referred to the occasional presence of a substance which he supposed was a "bile mucin" in the urines of very grave and chronic cases of icterus (due to malignant disease or chronic obstruction of the bile-duct from cholelithiasis).

Professor W. D. HALLIBURTON, in summing up the discussion, congratulated the society on the wide range and value of the contribution. He especially referred to Dr. Brodie's experiments. It was these which lent greatest support to the hypothesis he had advanced concerning the size of molecules and the permeability of cells as explaining the different forms of albuminuria. He thought Dr. Brodie's experiment of making a dead kidney in a bottle pass water added great confirmation to the physical as against the vital explanation. Mr. Cammidge's observations were interesting, but were open to numerous fallacies both in regard to the presence of pus and albuminose and also to certain fallacies in the processes employed. They only showed that serum albumin came through more readily than did globulin. Turning again, in conclusion, to the size of the molecules it was clear that some of the ordinary proteids possessed molecules of immense size, since hæmoglobin which was most easily diffused, possessed a molecular weight of over 1600.

OPHTHALMOLOGICAL SOCIETY.

Family Tendency to Ophthalmoplegia Externa.—Meningitis followed by Panophthalmitis.—Pigmented Tumour of the Eyeball removed; death from Multiple Pigmented Carcinoma nearly 14 years later.—Green Vision.—Exhibition of Cases and Card Specimens.

AN ordinary meeting of this society was held on March 8th, Mr. G. ANDERSON CRITCHETT, the President, being in the chair.

Mr. W. M. BEAUMONT (Bath) read details of a series of 12 cases of Ophthalmoplegia Externa occurring in Four Generations of an otherwise Healthy Family. This was no doubt due to nuclear disease limited to a small area. It was never congenital, but came on in adult life and slowly progressed until all the external ocular muscles were affected. Ptosis occurred in all and was an early symptom, but there was never ophthalmoplegia interna. In the advanced cases there was great weakness of the orbicularis palpebrarum. There was no other paralysis nor were any of the special senses affected. The first case—the ancestress of the family—died in extreme old age, her son died aged 90 years, while another died at the age of 85 years. One of the family had been shown to the society by Mr. J. B. Lawford and the case was recorded in Vol. VII. of the Transactions. Photographs of most of the others were shown and they all had ptosis. Mr. Beaumont thought that this was the first time that a family of 12 had been recorded suffering from this condition and he regretted that time and space—time because the cases were spread over four generations and space because they were spread over four quarters of the globe—prevented him from giving fuller details.—Mr. RICHARDSON CROSS (Bristol), who had seen one of the affected members, said the hereditary tendency was well marked and he had made a diagram of the relationships at the time. All the external eye muscles were affected.

Mr. A. QUARRY SILCOCK read a paper on Meningitis followed by Panophthalmitis. He said that the interest in this case lay chiefly in the fact that both eyes were affected by a diffuse inflammatory change (panophthalmitis) the result of general septicæmia, and in so early a stage of the latter as to constitute one of its most prominent signs. The man, aged 35 years, was admitted to St. Mary's Hospital under the care of Dr. W. B. Cheadle on Oct. 14th, 1899. He

was well and at work until Oct. 4th, when he was taken with shivering fits, pains in the chest, headache, cough with blood-stained sputum, and delirium at night. Since Oct. 7th he had persistent pain in the back of the neck. He answered questions intelligently; he complained of headache and pain in the chest. The temperature was 101° F. There were no symptoms of cardiac lesion or any obvious lung changes affording an explanation of the patient's condition. On the 15th, the day after admission, it was noticed that the right eye was inflamed (uveitis and hypopyon, chemosis of the conjunctiva). In the left eye the media were turbid, impeding a view of the fundus. The right eye was proptosed. On the 16th Mr. Silcock, after consultation with Dr. Cheadle, excised the eye, hoping that its examination would throw some light on the nature of the infection. This was done by Mr. H. G. Plimmer, who found that the infection of the eye was due to the streptococcus lanceolatus. The man became rapidly worse and died in a semi-comatose condition on the 17th. The post-mortem examination showed extensive basic meningitis and subarachnoid hæmorrhage in the lower dorsal and lumbar regions; there were recent vegetations on the aortic valves and embolic lesions in the lung and the spleen. The proptosis of the right eye was clearly due to œdema of the orbit. The examination of the eyes (the left was examined by Mr. C. D. Marshall) showed purulent panophthalmitis, but whether this condition was secondary to meningitis or was a part of the septicæmic condition was uncertain.—The PRESIDENT remarked on the extreme rarity of the case and said that he had never seen one in which both eyes had been affected.—Mr. RICHARDSON CROSS said that though he had never seen a case in which both eyes were affected he had one case under his care in which one eye was lost during an attack of epidemic cerebro-spinal meningitis, and he read notes of this case.—Mr. NETTLESHIP said he had seen cases like that recorded by Mr. Cross. In one, a girl aged 10 years, attacked with a sister with symptoms attributed to influenza but closely resembling meningitis, there were iridocyclitis and lymph in the anterior chamber. Vision was recovered to the extent of $\frac{6}{9}$. In another case recorded in Vol. V. of the Transactions a child aged two and a half years had iridocyclitis in one eye with pains in the limbs and joints and the vitreous became opaque and degenerated. There was meningitis and death occurred after six weeks. Such cases had been called pseudo-glioma. Coagulated lymph was smeared over the iris and the eye usually become soft and shrunken.—Mr. E. TREACHER COLLINS had met with a similar case exhibiting iridocyclitis with yellow exudation into the vitreous. The eye was excised and the patient died with meningitis and otitis. The inflammation could be traced by way of the optic tracts and nerves to the papilla and eye.—Mr. HOLMES SPICER mentioned one instance in a woman aged 40 years in whom nodular iritis followed by shrinking of the globe occurred in one eye after the other in the course of a week, with loss of both, as a result of infective embolism derived from septic abortion.

Mr. HERBERT FISHER and Dr. CHARLES R. BOX related a case of Primary Pigmented Tumour of the Eyeball for which the eye was excised in 1885, the patient being a man at that time aged 42 years. 14 years later he was re-admitted into St. Thomas's Hospital with great enlargement of the liver, accompanied by jaundice, abdominal pain, sickness and diarrhœa, and œdema of the lower extremities. For 15 months the abdominal swelling had been progressing with general weakness and loss of flesh. The patient died and a post-mortem examination showed that the liver was almost replaced by a nodular mass of melanotic growth weighing 12 pounds 6 ounces. There were also a few pigmented growths in the left parietal pleura. A small pigmented growth of the size of a pea sprang from the myocardium and projected into the right ventricle. Microscopic examination of the liver growths proved them to be melanotic carcinoma and not sarcoma as had been expected. The eye containing the growth had been preserved and Mr. Treacher Collins was able to obtain sections of it. He reported the growth to have originated in the ciliary processes and to have extended thence into the iris and through the sclerotic. The cells were pigmented to a varying degree; they were small, polygonal and of an epithelial type and from their arrangement in rows Mr. Collins gave it as his opinion that this growth was carcinomatous in character. It was decided to submit the sections to a pathological committee of the society for further examination and report.—The PRESIDENT remarked on the extreme rarity of the case.—Mr. COLLINS supported his view as to the origin and nature of the primary growth.—Mr. DEVEREUX MARSHALL, although expressing no opinion as to the nature of the primary growth, said he had never heard of a case in which a true cancer had remained dormant for 14 years, though he had seen and published a case in which a patient had died from metastatic sarcoma 11 years and five months after an eye had been removed for sarcoma.—Dr. BOX added some details of the case, and Mr. H. FISHER briefly replied.

Mr. H. WORK DODD said that some months ago he exhibited to the society a patient who saw everything green, and since that time he had collected 13 published cases of this condition. In reviewing these he came to the conclusion that neither sex nor age had to be specially considered, and that errors of refraction and their effects might be excluded. The condition of the general health was noticeable in seven of the cases; two suffered from migraine, two from syphilis, and three from chronic lead poisoning. 10 of the cases showed some departure from the normal in their ocular structures, such as wounds, detachments of retina, choroiditis, optic atrophy, neuro-retinitis, as well as tortuosity of the retinal vessels. With the exception of two cases following one a wound and the other an operation for cataract the abnormalities were connected with the optic nerve and retina. As to the reason why these people had green vision these cases gave but little information. It should, however, be noted that the macular region of the retina in three of the cases was the part affected, and in two of the others the temporal side was indicated as being particularly disturbed. Looked at in the light of our knowledge of the conditions existing in tobacco amblyopia, possibly the same tissues were affected in the two conditions. Two of the cases in which green vision was noted only when the patients were in-doors seemed to depend on the character or degree of the illumination.

The following cases and card specimens were shown:—

Mr. J. B. LAWFORD: Growth (? tuberculous) in the Macular Region.

Mr. E. TREACHER COLLINS: Unusual Changes in the Macular Region.

Dr. N. BISHOP HARMAN: Central Choroiditis.

EDINBURGH MEDICO-CHIRURGICAL SOCIETY.

The Effect of Heredity on Disease.

A MEETING of this society was held on March 7th, Mr. A. G. MILLER, the President, being in the chair.

Professor D. J. HAMILTON of Aberdeen read a paper on the Effect of Heredity on Disease. He drew attention in the first place to the enormous amount of literature which had arisen on both the biological and medical aspects of the question. The mere congenital transmission of a disease from parent to child was not heredity. Most of such alleged cases were merely the result of contagion applied to the fœtus—the direct inoculation of the fœtus through the blood of the mother. Two theories had received most acceptance as regards heredity: (1) the pangenic theory of Darwin, or the transmission of acquired features; and (2) the theory of Weissmann, or the continuity of the germ plasm. With reference to what were generally known as hereditary diseases—e.g., tuberculosis—it was undeniable that that disease affected members of the same family and that the tendency to it had persisted in preceding generations, yet it was now asserted that the disease was not hereditary in young animals. The tendency depended either on direct inoculation or in the inheritance of a tuberculous predisposition to the disease. These could not, however, be the only causes. The conformation of the body showed it, as did also the liability of such individuals to certain other diseases. It was the habit of body which was inherited. Professor Hamilton thought that the epithelial coverings of the body in such individuals were too easily penetrated—that they did not resist the attacks of the tubercle bacilli sufficiently. It had been shown that when tuberculosis had been introduced amongst savage nations they had been decimated. No member of any community was immune to tuberculosis and there were few who could not be inoculated successfully. The lungs were the organs of the body which were chiefly affected and the epithelial coverings of these organs were very thin and delicate. Amongst children who exhibited the tuberculous form

of body it was found that catarrhal pneumonia and attacks of bronchitis were frequent and this might be due to an abnormal penetrability of the epithelium. It was not yet known whether the epithelium in other parts of the body in those predisposed to tuberculosis was preternaturally vulnerable. The great point to note was the great vulnerability of the epithelium and this was handed down from generation to generation. The dark olive appearance of the skin, the colour of the hair, the length of the eyelashes, the lanugo-like hair along the course of the spine and on the legs, all pointed to an abnormal condition of the epithelium, and this might be a cause for the predisposition. How had this habit of body arisen? Could it be generated by vicious surroundings or would such agencies produce such a condition? Professor Hamilton thought not. They must go much further back. These tuberculous features were due to a variation which had taken place far back in their history and which had been propagated. It might have been confined to one race at first, and so that certain type of constitution might have arisen. Gout was said to be engendered by high living and to be transmitted. It might, however, skip a generation and re-appear in the succeeding one. In many people no amount of food or drink would excite gout. Were the complex phenomena really due to high living? Might they not be a reversion to an earlier type? For example, birds and reptiles normally excreted large amounts of uric acid. The gouty habit had arisen as a variation and so was transmissible. Mental diseases, neuroses, &c., all showed a vulnerability of the nervous system and it was possible that this might be related to the vulnerability of the epithelium. Nerve-cells being so highly complex easily underwent degeneration. Such cells might break down as a result of strain due to an acquired lessening of resistance. Could external agencies bring about changes in the nerve-cells and might these be transmitted? Professor Hamilton referred to Brown-Séquard's experiments on guinea-pigs and the transmission of the epilepsy so produced to the offspring. Was there absolute proof to show that nervous diseases could be produced by, e.g., alcohol, and could these be transmitted? He thought that they had not this proof. In such nervous diseases there was probably an acquired weakness which was excited by some stimulus. Syphilis was not hereditary, but it certainly was congenital. It tended to die out in the early life of the first descendant. Hæmophilia was often truly a hereditary disease. It was a disease of the blood-vessels and not of the blood. This peculiarity was transmitted, as was also the tendency to hæmorrhoids. In hæmophilia, however, Professor Hamilton thought something more was transmitted and that it might be related to menstruation. The disease usually affected males and so it might be allied to the condition of fever, congestion of the genital organs, &c., which was seen occasionally in men at intervals of about a month (male menstruation). Might not hæmophilia be a manifestation of this menstruation in the male? Was there any evidence of the hereditary tendency to disease becoming eradicated by the breeding of certain strains liable to certain diseases with other strains having no such tendency to those diseases? As regarded variation in constitution, if a vicious line were introduced it might die out by breeding with pure stocks. As a cause of malformations in the fœtus Professor Hamilton believed that so-called maternal impressions had no effect. There was no evidence to show that a diseased first father might so influence the mother that the children of a second father might be affected. There was no evidence proving that a diseased condition of the body excited by external agencies could be transmitted.

Dr. T. S. CLOUSTON said that Weismann in his work on heredity made three striking admissions: (1) he admitted that the germ cells could be infected as by syphilis and so a disease might be transmitted; (2) that the law of non-transmission of effects of external agencies did not apply to the lowest organisms—that when they went low enough external agencies did act; and (3) that environment, especially climatic environment, had an effect on the nutrition of the germ cell so that it might be altered and thus the fœtus might be different from the parent. These admissions went a long way to satisfy the widespread medical opinion that heredity existed, as seen, for example, in five or six generations of tuberculous families. Again, the psychopathic constitution all its varieties might be studied for generations. Through environment and evil climatic and dietetic conditions the germ-cell might be affected. What could a good heredity give to an individual? A normal development was the greatest power given to an organism. If they had a debasement they got the origin of a vast number of the neuroses. By far the largest number of the neuroses developed during the developmental stage—e.g., epilepsy and St. Vitus's dance. Congenital defects likewise showed themselves at this period. Insanity occurred in its most marked forms in the developmental stages. When they thought of the immense complexity of each brain-cell they had only to realise that a very slight debasement of the developmental process would cause many of these lesions. Hereditary defects were due to an arrest of the maturation of the nerve-cells and these might give rise to many of the neuroses. The sexual and reproductive instincts threw an enormous strain on the constitutions of young men and girls. Growing old and dying were normal processes, but many became insane owing to an unphysiological mode of growing old. One set of tissues grew old in advance of others. In certain families there ran a tendency to an excessive use of alcohol. Many people had a lack of higher mental inhibition. The worst class of dipsomaniacs were adolescent cases. The disease arose during development. It was not a craving for alcohol but the controlling power was quite deficient. It was a hereditary weakness in reacting to alcohol and a very small amount had an intense effect upon them.

Professor COSSAR EWART congratulated Professor Hamilton on the orthodoxy of his teaching from the point of view of the biologist. He stated that variation was enormously common now; there were even epidemics of it. If they mixed up two different strains of wild animals they got a variation. Amongst the human race there was a constant mixing up and so there was a constant production of variations, and thus tuberculosis, gout, &c., might arise at any time. As regarded the influence of environment on germ-cells Professor Ewart stated that his experiments showed that the germ-cell was excessively sensitive but that they did not show that there was any transmission of acquired characters. Examples were cited to show that the maturity of the egg determined the condition of the adult. Professor Ewart believed that reversion did exist.

Dr. J. W. BALLANTYNE said that he had never believed in the theory of maternal impressions. There was evidence to show that fœtal tuberculosis did exist and that congenital cardiac disease might be due to tuberculosis in the mother. Malformations were more frequent in the descendants of those who had been alcoholic, gouty, rheumatic, or insane. The ultimate solution of the question of heredity must be arrived at through the germ.

Professor STEWART STOCKMAN, after some preliminary remarks, said that in all probability what was called the "tendency" to tuberculosis in human beings was the real disease and that if treated by tuberculin they would react. In the slaughter-houses of Edinburgh about 6000 calves were killed yearly and only one showed evidences of congenital tuberculosis. Of cows, from 12 to 80 per cent. were tuberculous. Of bullocks slaughtered not 1 per cent. were found to be tuberculous. Tubercle bacillus from one species often failed to produce the disease in another, as, for example, fowls seldom took human tuberculosis. Cancer was never thought by veterinary surgeons to be hereditary in animals; and glanders, though it ran a very chronic course, like tuberculosis, was not hereditary.

Dr. ALEXANDER JAMES, Mr. JOSEPH BELL, and Professor SCHÄFER took part in the discussion and Professor HAMILTON replied.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF STATE MEDICINE.

Presidential Address.—Infantile Insanity.

A MEETING of this section was held on Feb. 16th.

Sir CHARLES A. CAMERON, C.B., on taking the Presidential chair, thanked the Council of the Section for having nominated him as President and the Academy for having elected him. He then gave a short historical account of the origin of the section. The Academy was formed in 1882 by the amalgamation of the Medical, Surgical, Pathological, and Obstetrical Societies. At that time there was in existence a Society of Metropolitan Officers of Health, which met monthly and of which he was President. He suggested that as the various medical societies were being amalgamated it would be desirable that their society should

enter into the union under the title of the Section of Hygiene. There was considerable opposition to this proposal on the grounds that it would unduly increase the number of sections, but ultimately the proposal was adopted in a modified form and a sub-section of hygiene was constituted. The four sections were each to have a president, but the sub-section was to have only a chairman. Some years subsequently the sub-section was elevated to the dignity of a section and the chairman was converted into a president. He was the first chairman, and now, after an interval of 18 years, he again filled the highest office under the title of president. While commenting on the notification of infectious diseases he said that the Corporation of Dublin had included measles and whooping-cough in the schedule, but whooping-cough had since been eliminated, as no good had resulted from notification of that disease. Measles was hardly notified in any town save Dublin, but it was desirable that it should be notified. With regard to the use of preservatives in food he believed that some of them, such as boric acid, if used in moderation, would be useful. It was better to consume food kept fresh with a very moderate amount of preservative rather than food in a state of incipient decomposition and containing deadly ptomaines.

Mr. WALTER BERNARD delivered an address on Infantile Insanity. He said that the importance of studying the science and art of influence in the peculiarly impressionable epoch of infant life, during the many-sided, rapid periods of evolution, had hitherto been practically disregarded. Here it was not to the specialist that aid and the solving of difficulties must be looked for. The family practitioner alone was placed in the position for disciplining the faculties by his observed facts, and while engaged in this work for the future culture of the world he elevated those who carried out his directions on mental sanitation, practical life, knowledge, and truth. Besides, he held the key to the family pedigree and ancestral history. His insight, extended experience, and close observation enabled him, at this very early stage, before mental action and mentation were evolved, to control inherited conditions. By judicious training those born with insane propensities could be made not only able to take care of themselves, but could be converted into good citizens.

Dr. DOYLE thought that self-control was the point needing greatest emphasis. He had seen very marked improvement effected in a case which had been sent to an institution in Holland where the patients were taken charge of by farmers and where no education was attempted, the patients being chiefly employed in manual labour.

Sir FRANCIS CRUISE said that he had seen children of two and three years of age whose mental condition pointed to insanity and who ultimately proved to be insane. He was strongly convinced that a great many children were insane.

Dr. LITTLE agreed that a great deal could be done in the training of children who had a tendency to grow up imbeciles. About 15 years ago a boy came under his notice who was growing up an imbecile. He was sent to an institution near London and he was now in a good position.

The PRESIDENT referred to the work which was being done by the London School Board in the training of children with impaired intellects. The children were examined by the medical officers of the Board and special classes had been formed for the purpose of teaching those who were the subjects of mental disease.

OTOLOGICAL SOCIETY OF THE UNITED KINGDOM.—A meeting of this society was held on March 5th, Sir William Dalby, the President, being in the chair.—The President announced that the council had appointed an investigating committee, consisting of himself, Dr. Herbert Tilley, and Mr. Arthur Cheatle, to inquire into the Condition of the Ears in School-children.—Dr. Dundas Grant showed a case of old-standing Perforation in the Postero-Superior Segment which had been healed by means of the application of trichloracetic acid and in which there was improvement in hearing.—Dr. Urban Pritchard showed a patient who had had the Malleus Removed for long-standing Suppuration with Perforation in the Membrana Flaccida. Sound healing had occurred and the hearing was improved.—In discussing the case Mr. Richard Lake and Mr. Cheatle advocated the operation of removing the remains of the membrane and ossicles in cases of chronic suppuration in which healing did not occur as a result of thorough ordinary treatment and in which there was no indication for the complete post-aural operation. If the operation failed to cure it served demonstrate that more radical measures were necessary.—Mr. C. A. Ballance had seen a good many of Mr. Lake's cases and had been highly pleased with the results.—Mr. Richard Lake showed a patient who had an Exostosis growing from the Posterior Wall of the Right Meatus and almost filling the canal which was periodically blocked by cerumen.—The President and Mr. Cheatle advised chiselling the growth away after turning the auricle forwards.—Mr. Lake also showed a patient with Destruction of both External Attic Walls resulting from chronic suppurative trouble in that region. The disease was soundly healed and the remainder of the membranes was intact.—Dr. Herbert Tilley showed a child with Congenital Dimples in Front of each Auricle. The condition was present in the father, in three of the aunts, in an uncle, and in a cousin.—Mr. Arthur Cheatle related a case under his care in which a Dimple was present on one side and a Sinus on the other. The sinus extended upwards, backwards, and inwards for some distance; an abscess formed periodically, leaving an ulcer which would heal, but the sinus remained. Healing occurred after laying the various branches freely open, dissecting away lining membrane, and applying pure carbolic acid.—Dr. William Milligan had seen a similar case which was tuberculous.—Mr. Cheatle also showed two patients on whom the Complete Post-aural Operation had been performed, in the first case five weeks previously and in the second case three weeks previously. Packing had been left off in both, and they were being treated by daily syringing with carbolic lotion, 1 in 60, and instillation of spirit, nitrate of silver being applied to any exuberant granulations. There was little discharge in either case.—Mr. Ballance recommended epithelial grafting and stated that the bone surface could thereby be completely healed within a fortnight of the original operation, possibly in less.—Dr. Milligan and the President concurred.—In reply to Mr. E. B. Waggett, Mr. Ballance said he had used small grafts, but they were not at all comparable in results with the large grafting method.—Mr. Arthur Cheatle showed specimens from Fœtal to Adult Life of the Recess under the Fallopian Aqueduct. The space had been described by Steinbrügge and named by him "sinus tympani." Mr. Cheatle also described a recess outside the eminentia pyramidalis which sometimes ran outside the Fallopian aqueduct and dipped downwards for some distance.—Mr. W. C. Bull showed a Sequestrum of the Petrous Bone which had been exfoliated spontaneously from a child, aged three years, leaving a smooth healed cavity.—Mr. Ballance suggested that it was tuberculous in origin.—Mr. L. A. Lawrence showed an elderly woman with a Papillomatous Growth in the Meatus. The opinion was expressed that it was probably malignant and that radical operative measures were necessary.—Dr. St Clair Thomson showed a man with a Perforation in Shrapnell's Membrane with Cholesteatomatous Formation.—Cholesteatoma was also packed down behind the posterior segment.—Mr. Ballance and Mr. Cheatle advocated removal of the membrane, the malleus, the incus, and the outer attic wall, and if these measures were not successful the complete post-aural operation. In discussing the cases shown by Dr. Dundas Grant and Mr. Arthur Cheatle at the last meeting of Recovery from Thrombo-Phlebitis of the Lateral Sinus following clearing out of the Sinus without Ligature of the Internal Jugular Vein, Mr. Ballance thought that if a localised abscess was present in the sinus it was not necessary to ligature the vein.—Dr. Milligan alluded to a similar case described by Mr. A. Young in the *Glasgow Medical Journal*.—With regard to Mr. Cheatle's case of Adeno-Carcinoma of the Meatus the President said it was rare for malignant disease to attack the meatus in that way. All the cases he had seen of epithelioma commenced in the tympanic cavity with the exception of one, which commenced in the skin over the mastoid process.—Mr. A. E. Cumberbatch related a case of Malignant Warty Growths of the Meatus in a woman aged 64 years.—Dr. Milligan and Mr. Secker Walker related cases of Epithelioma of the Auricle.—Mr. Cheatle stated that cancer was much more frequent on the auricle than in the meatus, as many specimens of the former were found in the museums of the London hospitals and exhibited in the International Congress Museum, while of the latter the number was very small.—In discussing Mr. Waggett's case of Exfoliation of the Cochlea the President and Mr. Lake alluded to similar cases.—Mr.

Ballance said that as there was still suppuration from the petrous portion further operation was necessary in view of the danger of possible infection of neighbouring parts. He had healed cases of suppuration in the same situation.

BRITISH GYNÆCOLOGICAL SOCIETY.—A meeting of this society was held on March 8th, Dr. W. J. Smyly, the President, being in the chair.—Mr. E. Stanmore Bishop (Manchester) showed the following:—(1) Sclero-cystic Ovary, History and Symptoms simulating Ectopic Pregnancy; (2) Double Papilloma of the Broad Ligament; (3) Large Pyosalpinx, the symptoms of which simulated Appendicitis; (4) Sloughing Fibro-myoma; and (5) Multiple Uterine Fibro-myoma, with central suppuration in one mass.—The discussion on these specimens resolved itself mainly into a discussion of Mr. Stanmore Bishop's final proposition—namely, that whilst some fibroids such as those discovered by accident having given rise to no symptoms whatever are best ignored entirely, whenever a fibro-myoma shows signs of growth it is wisest to remove it, and with it the organ in which it has developed, the uterus; the removal or otherwise of the appendages to depend entirely on their diseased or healthy condition.—After some remarks by Dr. Mansell Moullin and Dr. C. H. F. Routh Dr. Macnaughton Jones said that it had been laid down as an axiom in surgery that if the risks attendant upon an operation were not in themselves greater than those arising out of the disease for which it was proposed to operate, then operation was advisable and justifiable. The mortality from fibroids which were left alone was probably at least equal to 8 per cent., which was the percentage of fatal results from supra-vaginal hysterectomy in skilled hands. Of course, there were tumours which gave rise to no troublesome symptoms and which no one would operate upon and in which operation would not be justifiable.—Mr. Bowreman Jessett expressed his surprise at the paper recently published by Dr. F. H. Champneys in THE LANCET[1] giving the mortality of hysterectomy for fibroids at 18 per cent. It was to be remembered, as had been pointed out by Mr. Harrison Cripps, that many of the patients who were operated on in St. Bartholomew's Hospital were already *in extremis* before operation; such cases should not be included when estimating the mortality of the operation; they, however, amply supported Mr. Stanmore Bishop's contention that cases which gave rise to symptoms should be operated on early.—After some observations by Dr. Herbert Snow and Mr. Charles Ryall, Mr. Christopher Martin (Birmingham) remarked that the question of the early removal of fibroids turned very largely on the risk of malignant changes supervening in these tumours. As to the choice of operation, he preferred panhysterectomy, of which the results were very good; he had now done 35 of these operations with one death.—Dr. William Walter (Manchester) advocated the *via media*; further they had to be influenced by the position of the patient. If she were a working woman, whose family depended on her work for their maintenance, operation should not be insisted upon unless the tumour were altering in consistence or increasing in size.—Dr. T. M. Dolan (Halifax) said that the difficulty experienced by general practitioners in the matter resulted from the fact that such wide divergence of views obtained among the leaders of the profession. He deprecated the attitude of those who advocated that the patient should wait for the "change of life"; by the time that this came about the patient was in many cases moribund and all that was left for the general practitioner to do was to sign the death certificate.—Dr. Inglis Parsons pointed out that among working women an operation was often urgently required in order to enable them to do the work on which their very existence depended; but it was often permissible to do no operation in the case of a patient who could afford to be an invalid.—The President expressed his belief that the mortality of the operation depended not only on the dexterity, but also on the views, of the operator: one who believed that most cases should be operated upon would probably have a mortality of from 5 to 8 per cent.; one who held the views of Dr. Champneys would probably reach a mortality of from 18 to 20 per cent.; whilst the surgeon who held an intermediate position would have an intermediate mortality. He congratulated Mr. Christopher Martin on his excellent results and expressed his own preference for the operation of panhysterectomy.—Mr. Stanmore Bishop replied.—Dr. Macnaughton Jones exhibited the Right Appendages of a patient in whom there had been a complication of symptoms—renal, uterine, and peritoneal—making the diagnosis of the actual condition difficult. She suffered from endometritis and had been recently married. Operation by posterior colpotomy revealed a cyst in the right mesosalpinx lying upwards and to the left side, while the ovary, enlarged and cystic, was in the normal position. The cyst was tapped and the adnexa were removed. The patient was now well. Dr. Macnaughton Jones also showed a large solid tumour of the ovary complicating cystoma. The solid mass filled the entire pelvic cavity. A diagnosis had been made of fibroma of the uterus, but laparotomy proved that it was ovarian. A report on the nature of the tumour would be made by Mr. J. H. Targett. The patient was doing well. He showed also a large Fibroma of the Uterus removed by Supra-vaginal Hysterectomy from a patient who had been several times operated on for sarcoma of the breast, with recurrences in the side of the thorax. From this she had perfectly recovered and it was feared that the pelvic tumour was also sarcomatous, but it proved to be a fibro-myoma. The patient made a good recovery.—Dr. William Walter showed a specimen of Uterine Myoma complicating Pregnancy.—Mr. Skene Keith showed a recent specimen of a large Uterine Myoma weighing 36 lb. The patient was progressing favourably.

[1] THE LANCET, Jan. 20th, 1900, p. 147.

LIVERPOOL MEDICAL INSTITUTION.—The fourth meeting of the Pathological and Microscopical Section of this society was held on March 15th, Mr. F. T. Paul being in the chair.—Mr. F. W. Bailey showed specimens of a Carneous Mole and of a Nasal Polypus expelled by sneezing.—Dr. J. Lloyd Roberts showed an Aortic Aneurysm from a man who had been under observation for a long time and who died from other causes. During expiration the pulse in the right radial artery disappeared and it was suggested by Dr. Hay that as the aneurysm was on the posterior region of the aortic arch it was pressed during expiration against the innominate artery and so caused the right radial pulse to disappear.—Dr. J. Wigglesworth showed a case of Double Porencephaly.—Dr. A. W. Campbell showed specimens and drawings illustrating the arrangement of the nerve-cells and nerve-fibres in the cerebral cortex in cases of idiocy. The drawings, which were of special excellence, were made to scale with the aid of an Abbé's drawing apparatus.—Dr. Alexander showed specimens of a Round-celled Sarcoma of the Testicle and Tunica Vaginalis of nearly three years' growth.—Dr. K. A. Grossmann showed specimens from a Tumour of the Orbit of six years' growth. Partial removal in 1894 resulted in recovery of sight; in October, 1899, it was found necessary to remove the new growth and the eyeball. The growth consisted of spindle cells, fibrous tissue, and muscle fibres.—Mr. Larkin showed specimens from an Epithelioma of the Penis. The growth was accompanied by extreme pain, and Mr. Larkin drew attention to the fact that it had extended along the perineural sheaths of the nerves, separating the lamina and causing proliferation of its cells, and that this would account for the pain. Mr. Larkin also showed a specimen of Multiple Carcinoma of the Scalp. Between 20 and 30 small tumours were present, varying in size from that of a small pea to that of a hazel nut. They were all quite separate. The occipital glands were secondarily affected. The structure resembled rodent ulcer.—Professor Sherrington showed normal specimens of the Organ of Corti and sections of the Brain from the Olfactory Region of the Rabbit.—Dr. R. J. M. Buchanan showed a specimen of a Nipple from a case of Early Cancer of the Breast. The nipple was clinically healthy, but the microscopic examination proved it to be profusely infiltrated with cancer.—Dr. Bradshaw showed specimens of a rare Crystalline Urinary Deposit.—The specimens were discussed by Mr. Paul, Dr. Alexander, Dr. Hay, Dr. J. Lloyd Roberts, Mr. O. Bowen, Dr. Grossmann, and Mr. Larkin.—Dr. Hay read a note on a Series of Hearts containing Thrombi. The thrombi were old-standing and not of the cadaveric or "agony" type. The series served to illustrate (1) the usual sites of thrombi; (2) the forms of thrombi; and (3) the associated conditions, and they included thrombi in the left auricle, left auriculo-ventricular orifice obstructing the blood flow, in the apex of the left ventricle, in the infundibulum of the left ventricle giving rise to signs of aortic obstruction, and attached to the aortic valves.—In the series there were solid, dense thrombi, cystic thrombi,

stratified flat thrombi, and pedunculated thrombi. The note was illustrated by specimens, photographs, and lantern slides.—Dr. J. Barr discussed the note and Dr. Hay replied.—Mr. F. T. Paul read a short paper on Congenital Cysts of the Neck. Attention was specially drawn to cysts arising from the sinus præcervicalis, the thyro-glossal duct, and lymph-angiomata. Mr. Paul considered that owing to the dual character of the structure of the cysts arising from the second branchial cleft the cysts were derived partly from the surface and partly from pharyngeal structures, the latter containing much adenoid tissue in the form of small nodules. Cysts from the thyro-glossal duct were lined with columnar ciliated epithelium and were situated in the median line.—In the discussion which followed Mr. Larkin recognised in the cysts from the second branchial cleft structure resembling the tonsil.—Professor Sherrington stated that in 30 thyroid glands from dogs examined by him he only remembered one having ciliated epithelium.—Mr. Paul replied.

BRITISH LARYNGOLOGICAL, RHINOLOGICAL, AND OTOLOGICAL ASSOCIATION.—A meeting of this society was held on March 9th, Dr. Barclay Baron, the President, being in the chair.—The President alluded with regret to the loss sustained by the association in the death of Dr. MacNeill Whistler, one of its founders and a former president.—A vote of condolence with Mrs. Whistler was unanimously passed.—Mr. Mayo Collier showed a case of Abductor Paralysis of the Left Vocal Cord in a young woman, the cause of which was undetermined.—Mr. Lennox Browne opened a discussion on the Conditions of the Throat and Larynx Simulating and Predisposing to Tuberculosis. He began with the statement that although it did not so frequently fall to the lot of the laryngologist to decide doubts as to the tuberculous, non-tuberculous, or pre-tuberculous condition of a throat or larynx as was the case with physicians devoting themselves to disease of the chest the responsibility was no lighter nor was the issue less vital. It was, however, a fact that occasionally the prodromata of tuberculosis could be discerned with the laryngeal mirror before the ear could detect them with the stethoscope. In such circumstances it was possible to arrest the disease in the higher situation. Dismissing shortly instances of simple inflammations, of syphilis, and of lupus in the larynx which might be mistaken for tuberculosis attention was drawn to the influence of nasal obstruction and faucial irritation in bringing about conditions not only liable to be mistaken for tuberculosis but as distinctly forerunners of that disease. Many cases were reported showing that there were no definite laryngeal evidences which could be accepted as criteria of a tuberculous condition or tendency thereto and the same might be said with regard to physical signs in the chest and even of the bacteriological features, for one case was related of a patient in whom, with a history of hæmoptysis, want of resonance, moist râles, and old adhesions, together with the presence of bacilli, complete recovery of health took place after efficient treatment of faucial irritation. In this case an eminent physician, without committing himself to the statement that the patient was free from the danger of tuberculous trouble, was of opinion that "looking at the progress of the case the consolidation had been mainly of a broncho-pneumonic nature set up by the violent cough from which the patient had suffered and which had been so remarkably checked" by faucial and laryngeal treatment. The indications for treatment of the class of case considered were: (1) to clear away all obstruction to free nasal respiration; (2) to remove all source of irritation in the palate and fauces; (3) to correct the products of catarrh by suitable intra-laryngeal treatment (Mr. Lennox Browne preferred sprays of guaiacol diluted 50 per cent. with almond oil carried deeply into the larynx and trachea under pressure); and (4) while recognising the value of the open-air treatment he thought a warning was due not to surrender entirely, as there was a tendency to do, attacking the disease by drugs, and especially where, as was the case in the throat, the site of infection was well within reach.—Dr. Thorowgood observed that prominence of the arytenoids and infiltration of the commissure were valuable indications of pulmonary tuberculosis, with which disease also an anæmic condition of the pharynx and laryngeal region was often associated.—Dr. J. Macintyre (Glasgow) expressed his belief in a pre-tuberculous condition in the larynx before a bacillary diagnosis could be made.—Mr. Mayo Collier spoke of the increasing rarity of tuberculous affections the higher the respiratory tract was ascended.—Mr. St. George Reid discussed the significance of micro-organisms in sputa, notably of the micrococcus tetragonus, as a possible forerunner of tubercle bacilli.—Dr. Dundas Grant spoke of cases which simulated tuberculosis.—The discussion was continued by Mr. Foster Palmer, Dr. P. Abercrombie, Mr. Wyatt Wingrave, and the President.—Mr. Lennox Browne replied.

FORFARSHIRE MEDICAL ASSOCIATION.—An additional meeting of this association was held in the University College, Dundee, on March 7th, Dr. C. Templeman, the Vice-President, being in the chair.—Mr. D. M. Greig showed a patient, a man, after Excision of the Left Upper Jaw for Sarcoma and pointed out the slight deformity following such an operation.—Mr. Greig also showed a boy with Coxa Vara, pointing out the altered movements of the hip-joint and the attitude in standing and lying which was exhibited by patients suffering from this affection.—Mr. Greig also showed several specimens: (1) The Upper Jaw with Tumour attached removed from the patient previously shown; (2) a Femur removed by Amputation for Acute Osteomyelitis; and (3) two specimens with Loose Bodies in the Tunica Vaginalis Testis removed after death from a case of Lympho-sarcoma.—Professor C. R. Marshall read a paper on the Nitrites and Allied Substances, giving his classification of them and illustrating by means of the blackboard and sphygmographic tracings the actions of the members of the various classes. He explained how it could be shown by experiment that these substances only acted on the blood-vessels and not on the heart. He also pointed out the various steps that had been taken in order to find a substance with a similar action to nitro-glycerine or glycerol-nitrate but which had a more prolonged or lasting action. The toxic effects of these substances were then shown to be due to their power of forming methæmoglobin in the blood and the sodium nitrate was in doing this more rapid than nitro-glycerine. The therapeutic uses of these substances were next touched on—in angina pectoris, in cardiac failure, and in arterial sclerosis.—Professor A. M. Stalker, in some remarks on the paper, emphasised the beneficial effects of iodide of potassium in arterial sclerosis.—The Chairman also commented on the paper and Professor Marshall replied.—Dr. George Whyte gave an account of a case of Corrosive Sublimate Poisoning which had resulted in recovery partly due to vomiting being induced early and partly to its solubility in alcohol. The quantity taken was equal to 9·6 grains. The symptoms, severe vomiting and purging, were treated by 20 minims of tincture of opium every four hours to begin with. The patient resumed his occupation on the fifth day after taking the poison.—Professor Marshall and the Chairman made some remarks on the subject and the difficulty in knowing the exact amount taken.—Professor Stalker gave notes of a case of Subacute Endocarditis which he had had under his care. The case showed some difficulty in the diagnosis. There were a persistent temperature and some cough, and later a mitral systolic murmur was made out, but for a time the case resembled one of pulmonary tuberculosis. There was no rheumatic history and the case did not present the appearance of a cardiac case.—Professor L. R. Sutherland showed the Heart from this case which had vegetations in the mitral cusps. Several of the chordæ tendineæ had given way, causing the valve to flap during the heart's action and infect the endocardium in the auricle. He pointed out that the orifice, though in life it must have been narrowed, still admitted two fingers. He considered that the separation of chordæ tendineæ was not such a rare affection as was generally made out.—Dr. W. E. Foggie emphasised the importance of watching the temperature in such cases.

FOLKESTONE MEDICAL SOCIETY.—A meeting of this society was held on March 2nd, Dr. T. Eastes (Vice-President) being in the chair. The minutes of the last meeting were read and confirmed. Mr. H. A. Powell then played "Rule Britannia" and the members sang the chorus with much enthusiasm. A musical programme was then gone through and Dr. C. E. Perry, Dr. Eastes, Dr. E. Norton, Mr. A. J. Gore, and Mr. Yunge-Bateman sang, while Mr. W. F. Chambers played the mandolin and Dr. Chubb the flute. Dr. J. H. Ewart gave a recitation and Mr. Thornton Gilbert a demonstration on card tricks and thought-reading. After "Soldiers of the Queen" had been sung by Dr. Perry a collection was made on behalf of the Royal Army Medical Corps Fund and the sum of £2 15*s.* was collected. The meeting was one of the most successful in the annals of the society.

Reviews and Notices of Books.

A Text-book of Physiology. By WINFIELD S. HALL, Ph.D., M.D. Leipsic, Professor of Physiology, North-Western University Medical School, Chicago. Illustrated with 343 Engravings and six Coloured Plates. London: Rebman, Limited. 1900. Pp. 671. Price 20*s.* net.

IT speaks well for the progress of education in America, as well as in this country, that the author of the volume before us, which is the most recent work on physiology, should expect that the student who takes it as his text-book has received what may be termed a liberal education, that he is familiar with the elements of physics, that he has acquired a fair knowledge of mathematics and of chemistry, and that he only requires to be reminded of recent work in histology. Without this amount of preliminary education he will hardly be able to comprehend the reasonings or the clinical applications of modern physiology. It could not be supposed that in the compass of less than 700 pages the varied functions of the body could be equally satisfactorily given. If some are dilated upon others are curtly treated, and it must rest with the individual teacher to determine what subjects he considers it to be most important for a student to know. For example, as a rule we think too much space is devoted to the special senses in text-books, and Dr. Hall has done wisely and well for the ordinary student or general practitioner in curtailing the chapters on these organs. On the other hand, he has dwelt at much greater length, and with advantage, upon the processes of digestion, upon the functions of circulation and respiration, and upon the nervo-muscular apparatus.

Dr. Hall's Physiology is valuable because it presents to the reader the physical side of the several functions to a large extent, and at the close of some of the sections problems are given with the mode in which they should be worked out. Thus, to give an example, the following amongst other problems are required to be solved in regard to the circulation: (*a*) How much (work) does the left ventricle perform in each systole if 120 cubic centimetres of blood are ejected against 14 centimetres of pressure? Answer: $W = 13{\cdot}6 \times 120 \times 14 = 22{,}848$ gramme centimetres. (*b*) How much work does the heart perform at each systole if the right ventricle expels the same quantity of blood against two-fifths as great pressure? Answer: $W = [13{\cdot}6 \times 120 \times 14] + [13{\cdot}6 \times 120 \times \frac{2 \times 14}{5}]$ or $\frac{7}{5}$ of work done by left ventricle alone = 31,987 gramme centimetres. In speaking of the cause of the sounds of the heart Dr. Hall can scarcely be said to commit himself positively to the opinion—now, we thought, agreed upon by all—that the second sound is caused by the closure or sudden tension of the semilunar valves, for he only says that the cause of the second sound "is quite generally interpreted in that way"; but in regard to the first sound he is positively heretical, for he does not admit that the auriculo-ventricular valves have anything to do with it. He gives four factors—viz., vigorous muscular contractions, friction of blood rushing through the semilunar valves, friction of heart incident to its change of shape within the pericardium, and, lastly, friction of heart against neighbouring structures in the thorax incident to its change of position in the thorax; but if the second sound is essentially caused by the sudden tension of the semilunar valves we can scarcely discard the bicuspid and tricuspid valves as of no importance in the production of the first sound. The whole of the section on the Circulation seems to be short, and, if only to introduce the name of Harvey to the student, we should have liked to see a line or two devoted to the "proofs of the circulation of the blood" as well as to the mention of other circumstances than the coagulation of the blood by which death from hæmorrhage is prevented.

A small and handy instrument is depicted, which Dr. Hall names the "hæmatocrit," by means of which the proportion of the corpuscles can be determined by centrifugal action. A coloured plate shows the varieties of blood-cells, though, perhaps, properly they should be called blood corpuscles. These are (1) normal red cells, (2) normoblasts, (3) microblasts, and (4) megaloblasts. Another coloured plate gives the varieties of leucocytes. These he names (1) polymorphonuclear neutrophiles; (2) myelocytes; (3) eosinophiles; (4) eosinophilic myelocytes; (5) large lymphocytes; and (6) small lymphocytes. In regard to the coagulation of the blood the author adopts the explanation advanced by Schmidt and Hammarsten that it is due to the nucleo-albumins prothrombin and thrombin. Both of these are derived from the katabolism of nuclei acting in presence of the alkaline earths on fibrinogen, and the fibrinogen is derived from cytoplasm that has successively generated cytoglobulin, preglobulin, and paraglobulin.

We like the mode in which Dr. Hall has attacked the several subjects. As a rule there is a short histological introduction which is well illustrated by figures usually borrowed from well-known and accredited sources, such as Klein, Schäfer, Piersol, and others of equal reliability, but it is evidently anticipated that the student has already completed a course of histology and hence such subjects as the internal ear and retina only occupy a page or two.

If we select such a subject as respiration, we find there is first a short introduction showing the object of respiration and giving its comparative physiology and its performance through the skin, by means of gills, and by lungs. No allusion is made, however, to the tracheal respiration of insects. Then the mechanical phenomena of respiration are considered, and it may be remarked in passing that the author regards the costal type of respiration observed among women of European races as a peculiarity developed by a mode of dressing which hampers the movements of the diaphragm while permitting the elevation of the ribs, a view to which we should be disposed to demur. There is a physical introduction giving the solution of various gases in liquids, which is followed by a section on the Mechanical and Physical Features of Respiration. Original drawings are here given of the stethograph and thoracometer, of the belt spirograph and the chest pantograph, with the graphic tracings obtained from their application to the chest, and there is an original and ingenious diagram showing the relations of tidal to complemental reserve and residual air in the acts of respiration. A section on the Chemistry of the Respiration follows, and a section is devoted to the Control of the Respiration, in the course of which experiments are briefly given from which the functions of the nerve trunks and centres implicated in respiration are deduced. The rest of the chapter is occupied with the Chemistry of Respiration.

It is remarkable that the author nowhere alludes to the average number of respirations per minute, or to the relation of the number of respirations to the number of cardiac beats, or to the modifications in number that are consequent on exercise, food, sleep, and other conditions. We have noticed some want of care in the correction for the press—Hammarsten, for example, being twice spelt erroneously—but as it is a first edition and the errors are sufficiently patent and are not of much importance we forbear to mention them, since they will no doubt be corrected in the next edition. In the meanwhile English students and teachers may purchase the work with the certainty that they

will obtain a thoroughly sound and reliable exposition of the present state of physiological knowledge.

Clinical Studies in Vice and Insanity. By GEORGE R. WILSON, M.D. Edin., Medical Superintendent, Mavisbank Asylum. Edinburgh: William F. Clay. 1899. Royal 8vo. Pp. 234.

THE relations of insanity and vice to the social and hygienic conditions under which we live have attracted much attention in recent years. In Professor Clifford Allbutt's System of Medicine (vol. viii.) Dr. Charles Mercier has published a most important memoir on the subject of insanity, vice, and crime, the inclusion of which in a System of Medicine is an indication of the direction in which the current of psychological medicine is moving. Dr. Wilson's work is conceived on somewhat different lines, and though the main thesis is devoted to the morbid mental and moral conditions resulting from alcoholism the work has in its limited sphere a distinct value and usefulness. Part I. deals with drunkenness and alcoholism and contains evidences of careful thought and observation. The practical diagnostic sign of drunkenness is laid down as the inability of the patient to control his habit. "Drunkenness is a disease which primarily affects the purposive functions. It spreads so as to involve parts of all the functions of intelligence ..... and the lesion is of progressive nature." The effect of this dissolution of mental and moral capacity is that the patient sinks to the level of a being of a lower order of intelligence while the general character grows childish and puerile. Instances are given in support of this statement and the method of treatment of drunkards is then briefly dealt with.

The alcoholic diathesis is next touched upon. As the result of inquiry it is stated that what may be called "low-class" drunkards are probably moral imbeciles, but that the average drunkards, who are in a large majority, are neither more weak-minded nor more strong-minded than their neighbours. Interesting clinical accounts and histories follow of various classes of alcoholics—e.g., high-class, average, and degenerate alcoholics. There is much interesting information in these histories, easily and pleasantly written in a somewhat discursive vein. A clinical study of insanity from the records of 15 cases follows and concludes the work. The chapters comprising this part of the work deal with cases of special interest, eight being of male and seven of female patients, each illustrating some interesting feature, social or medical. The work is on the whole suggestive, but there are a dogmatism and a directness of statement and opinion in it which make it an exposition of the author's individual views rather than a presentation of the various difficult and controversial facts and views regarding insanity and crime which are so strongly pressing on modern public opinion. It will be read with interest by alienists and by intelligent laymen who are interested in the medico-sociological aspects of insanity and crime, and should meet with success as a useful little introduction to the subject.

Physiology: A Manual for Students and Practitioners. By HOWARD D. COLLINS, M.D., Assistant Demonstrator of Anatomy, College of Physicians and Surgeons, Columbia University, New York; and W. H. ROCKWELL, jun., M.D., Assistant Demonstrator of Anatomy, College of Physicians and Surgeons, Columbia University, New York. Series edited by BERN. B. GALLAUDET, M.D. Illustrated with 153 engravings. London: Henry Kimpton. 1900. Pp. 323. Price 7*s.* 6*d.* net.

THE majority of teachers of physiology appear to find it requisite to write a compendium of their lectures, which may serve the students who attend their classes for home study, which shall contain the more important facts which it is desirable to remember, and which shall form a ground-work of facts that in their oral discourses they can supplement and expand. In this country there are several such manuals, and the professors at the different universities in America are beginning to pursue the same plan. By the steady avoidance of doubtful facts and of theoretical views a very considerable quantity of information can be compressed into a small space, and in reading the present volume it seems to us that much discretion has been exercised in the way in which each subject is handled. The chapter on Respiration, though short, contains most of the facts which the student needs to know, though we should be inclined to demur to the statement that at the close of each expiration the vagus filaments are mechanically pinched. In the section on Circulation it is stated that the non-regurgitation of the blood from the auricles into the veins is due to four causes—the insufficiency of the auricular contraction to produce a reflux, the contraction of the muscular coat of the great veins near the heart, the opposition of the weight of the incoming blood, and the opposition offered by the valves in the veins. But regurgitation is often seen in patients under chloroform when the force of the auricular contraction must be weakened and when the influence of the valves can be in no way interfered with. In reality the second of the above-mentioned causes is the most important. The pulse tracings are not satisfactorily executed and the dicrotism of the normal tracing is not referred to at all. The danger of compression to too great an extent is, of course, that important points may be overlooked. We notice that the vascular glands are all dismissed in ten lines with the bald statement that they agree in having no ducts, that they do not seem to be associated in either secretion or excretion, and that they have no definite functions, though their extirpation is attended with serious results. An opportunity is here missed of impressing upon the student the probability of internal as well as of external secretion. The adrenals are not even mentioned. The measurements are correctly given and the book will hold a good position amongst other works of the same size.

JOURNALS.

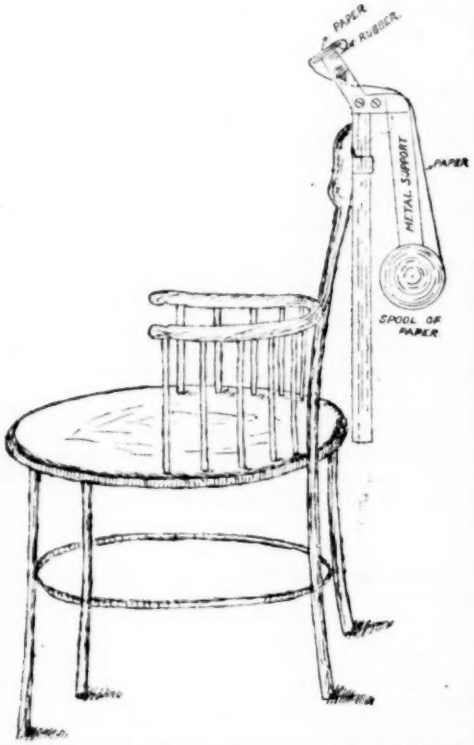
The *Veterinarian* for February commences with a couple of translations of lectures delivered by Professor Cadiot of Alfort, these being rendered into English by Mr. John A. W. Dollar, M.R.C.V.S., the subjects chosen being Blennorrhœa in the Dog and Amputation of the Penis in the Horse. The symptoms and treatment of the former are fully discussed and in the article upon the latter the various methods of operating, sequelæ, &c., are thoroughly entered into. Locomotor Ataxia in the Horse is commented upon; there is an original article by Mr. S. N. Ranina, an Indian graduate of the Bombay Veterinary College, on the Inoculation of Horses for the Preparation of Anti-plague Serum, and a continuation of an article on Sheep Scab summarised from the American Government report on the subject. Under "The Month's Progress" are extracts of interest from foreign literature. A report of the proceedings of the Council of the Royal College of Veterinary Surgeons and reviews of new books conclude the number.

The *Veterinary Journal*.—The February number of this journal contains editorial comments upon the inequality of the preliminary educational test in England and Scotland required to be passed by a student before entering any of the veterinary colleges. Original papers are written upon the Unsexing of Animals and Oöphorectomy in the Mare (a further comment on which we publish elsewhere), Non-contagious Skin Affections, and Certain Laboratory Methods for the Diagnosis of Certain Micro-organismal Diseases.

New Inventions.

A HEAD-REST.

THE objections to the head-rest on a barber's chair are manifest and manifold. The same rest is used for any number of people suffering possibly from all manner of skin and other diseases. The material (cloth, velvet, or leather) which is used to cover the wooden rest becomes the possible disseminator of various contagions. The head-rest described below is free from this danger. Instead of a hard wooden rest covered with cloth or some such material a piece of rubber band hung from two points (on the principle of leather springs or hangers for carriages) is used, so that the rest readily conforms to the shape of the



head when placed thereon. The rubber band is detachable and can be washed at any time. Lower down than this rubber rest is a spool of paper, either having an oiled surface or having been saturated with some disinfecting medium. This paper is perforated in suitable lengths so that it can be torn off as required. The paper is taken from the spool (as is shown in the above illustration) and is passed over the rubber band and then secured. The person who is being shaved rests his head on the paper which covers the rubber band. When the operation of shaving is completed the paper which has been used is torn off and a fresh piece is substituted by simply pulling paper off the spool of the necessary length. The papers can bear distinctive numbers, so that they can form a check on the assistants in the shop as to how many people they have attended to. The inventor of the head-rest is Mr. F. B. Smith, architect, of Port Talbot.

A NEW CHIMNEY COWL.

WE have received from Mr. John Spring, of 413, Cleethorpe-road, Grimsby, a photograph and description of a new pattern of chimney cowl, terminating above in four lateral outlets directed to any four equidistant points of the compass. Each outlet is covered by a sloping (nearly vertical) door or flap hinged at a point above its upper margin, each pair of opposite doors being rigidly connected to one another by means of the bars from which they are suspended. When the air is still each door stands out from the corresponding opening in the cowl for a distance of three inches at the bottom, diminishing to one and a half inches at the top. When a gust of wind strikes a door it shuts it and opens the opposite or leeward door three inches wider. A strip of indiarubber along the bottom edge of each opening renders the closing of the door noiseless. There are no internal parts to get out of order and the sweep's brush can be passed right in.

THE IRISH MEDICAL SCHOOLS' AND GRADUATES' ASSOCIATION.

THE St. Patrick's festival dinner of this association was held at the Hotel Cecil on March 17th, the President, Inspector-General Lloyd, R.N., honorary surgeon to the Queen, being in the chair. This was one of the best attended and most successful dinners of this important and increasing association. A large number of guests were present, the guests of the evening being Mr. W. H. Lecky, M.P., and Sir Dennis Fitzpatrick, K.C.S.I. After the health of the Queen and Royal family had been proposed and enthusiastically received Dr. J. Holmes Joy gave the toast of "Our Defenders," which was responded to by Surgeon-General Jameson, C.B., Director-General of the Army Medical Service, Fleet-Surgeon Delmege, M.V.O., and Surgeon-Captain Bourke. "Our Guests" was proposed in an able speech by Mr. P. J. Freyer, who was frequently interrupted by outbursts of applause, and responded to by the Right Honourable W. H. Lecky, M.P., and Sir Dennis Fitzpatrick, K.C.S.I. The toast of "Ourselves," proposed by Dr. W. S. Playfair, was responded to by the President. Dr. T. Mouillot gave the toast of "Our Lady Guests," for whom Mr. T. Lean Wilkinson responded. During the evening a selection of Irish songs was given by Mr. W. Nichol and Miss Elsie Nichol which was much appreciated Mr. J. J. De Zouche Marshall also contributed much pleasure to the association by singing two appropriate and well-rendered Irish songs. Mr. J. W. Ivimey accompanied at the piano. Much credit is due to the dinner secretary, Dr. Swanton, for the success of the evening, also to Mr. Freyer and Mr. James Stewart, the general secretary. During the evening the following telegram was forwarded to Her Majesty:—

THE QUEEN'S MOST EXCELLENT MAJESTY, WINDSOR CASTLE.

MADAM,—On behalf of the Irish Medical Schools' and Graduates' Association here assembled I beg to offer your Majesty our heartfelt gratitude for your Majesty's gracious recognition of the services rendered in South Africa by your Majesty's Irish soldiers, our fellow-countrymen, and for the highly prized permission to wear the shamrock on Saint Patrick's Day.

I humbly convey to your Majesty our full appreciation of your Majesty's gracious thought of our country at this time and earnestly pray that your Majesty's approaching visit to the Irish metropolis may be all that our loyal Irish hearts can wish for our beloved Queen.

I am, your Majesty's most faithful subject,
INSPECTOR-GENERAL LLOYD, R.N.,
Honorary Surgeon to your Majesty, President of the Hotel Cecil, St. Patrick's Day. Association.

The following is a copy of the reply which through an accident was not delivered during the dinner:—

TO INSPECTOR-GENERAL LLOYD, HOTEL CECIL.

The Queen desires me to thank the members of the Irish Medical Schools' and Graduates' Association for their loyal and kindly message which alludes to the national appreciation felt at Her Majesty's permission for the future wearing of the shamrock by her Irish troops on this day.

The Queen is gratified by their good wishes expressed for her coming visit to Ireland, to which event Her Majesty looks forward with much pleasure.

(Signed) BIGGE.

A telegram was also sent to Lord Roberts who had been a guest of the society on a former occasion:—

Accept our Patrick's Day wishes. Kindly convey them to fellow countrymen under command. We drink health, safe return.
LLOYD, President Irish Medical Graduates, now dining Hotel Cecil.

THE LANCET.

LONDON: SATURDAY, MARCH 24, 1900.

THE proceedings of the meetings of the Executive Committee which occur in the interval of the sessions of the General Medical Council are of interest as showing the continuity of the work of the Council in respect of certain questions in which the profession is interested. Several such questions came up for consideration at the meeting of the Executive Committee on Monday, Feb. 26th. The vacancy on the Executive Committee created by Mr. BRUDENELL CARTER ceasing to be a member of the Council was filled by the appointment of Dr. DONALD MACALISTER, the representative of the University of Cambridge on the Council. There can be little doubt that this appointment will be approved by the Council at large. Dr. MACALISTER takes a very active and valuable part in the proceedings of the Council, especially in his capacity of chairman of the Business Committee. It is obviously convenient and proper that the chairman of such a committee should be a member of the Executive Committee. Another personal matter of much interest is to be noted in the proceedings of the committee. Mr. FARRER, whose firm have acted as the solicitors to the Council since 1859, and who has personally filled the office since 1886, has in a letter to the President expressed his wish to resign at an early date on the score of age and the state of his health. At the request of the Council Mr. FARRER has consented to hold his office till the next meeting of the Council, when a successor will have to be appointed. The amount and nature of the legal business of the Council alter with the development of the Council's work and require knowledge and qualities of a kind which every good solicitor does not necessarily possess. The Council must be careful in its selection of a successor to Mr. FARRER. Much of the power for good of the Council depends on its lawyers and a good and strong solicitor may save it money and gain it credit. It is impossible to deny that in some recent legal proceedings the Council has not appeared to such advantage as it usually did in earlier days. This may not be altogether the fault of its lawyers. The Medical Acts are so loosely drawn that they admit of much bad litigation; but this is only another reason for having the best legal advisers who can be found.

The minutes of the Executive Committee are not very explicit in regard to the probability of legislation for amending the penal powers of the Council and of the medical bodies which grant degrees and diplomas, but the committee carried a motion authorising Mr. FARRER and Mr. MUIR MACKENZIE to prepare a Bill "in accordance with the clauses submitted to and approved by the Council on Dec. 2nd, 1899." We may remind our readers that the President at the meeting in December was requested to forward the same to the Privy Council and to express the desire of the General Medical Council that the Government should prepare or support a Bill for passing them into law. It may be assumed, from the statement made by the President of the General Medical Council to the Executive Committee and from the Committee's instructions to the lawyers, that Sir WILLIAM TURNER has had satisfactory assurances of support from the Government. So it may be hoped that the clauses in question, together with one for securing that fines for offences under the Medical Acts shall be paid to the credit of the General Medical Council, instead of, as at present, to the credit of the Metropolitan Police, will before long become law. One of the great evils of a state of war such as the present is that it interrupts all ordinary legislation. It would be too sanguine to expect just now such an amendment of the Medical Acts as is implied in the clauses approved by the universities, by the medical corporations, and by the General Medical Council, but we may nevertheless hope for some modest measure of success.

A subject of some difficulty and of much importance is that of reciprocity in the recognition of medical qualifications between this country and Italy. The General Medical Council at its last meeting instructed the President to ascertain if the Italian Government had arrived at any fixed determination to alter the law by which hitherto British practitioners have been allowed to practise in Italy. The President called the attention of the committee to the fact reported to it, that the Italian Government has under its consideration a Bill to exclude from practice in its territory foreign practitioners belonging to countries which do not grant reciprocal rights. The committee requested the President of the General Medical Council to call the attention of the Privy Council to this fact, which will doubtless also be referred to the General Medical Council for its consideration in May.

Medical practitioners know too well that any carelessness on their part in answering letters of inquiry from the Registrar in regard to their addresses or other matters is apt to be followed by their removal from the Register under the 14th section of the Medical Act of 1858. Such removal, though easily set right, is felt to be a great inconvenience. At the recent meeting a gentleman who had been removed under this clause applied to have his re-registration antedated "on account of serious legal disability under which he would suffer loss owing to the absence of his name from the Register from 1897 to Feb. 5th, 1900." The resolution of the Council was to the effect that the name was now restored and had been re-registrable at any time since its removal. This shows, what we should expect, that the Council cannot antedate a re-registration, and it emphasises the importance of more attention on the part of practitioners with regard to answering the letters of the Registrar.

We see with satisfaction that in noting the introduction of the Midwives Bill into Parliament the Executive Committee have represented to the Privy Council that the Bill does not make provision as advised by the General Medical Council for requiring licensed midwives to apply for qualified medical assistance in every case attended by them which presents symptoms of difficulty, abnormality.

danger, or disease on the part of the mother or child, and have expressed to his lordship their opinion that such a provision is one of imperative necessity for the safety of lying-in women. We venture to hope that upon such a grave expression of opinion by the Executive Committee of the General Medical Council the insertion of such a provision in the Midwives Bill will follow. There are many inherent objections to the Bill with such an addition; without it we regard the measure as unmitigatedly dangerous.

WE have before us a copy of the report and certificate submitted by an alderman of the Northamptonshire County Council under the Housing of the Working Classes Act of 1890, recommending his council to sanction the adoption of Part III. of the Act by the Brixworth District Council in respect of a Northamptonshire village named Spratton; and we have also before us an account, taken from a local newspaper, of the county council's debate on the adoption of the report. These documents form interesting reading. The Act in question has been of substantial benefit in metropolitan areas and possibly in urban districts outside London, but rural districts have hitherto made but little, if any, use of Part III., a portion of the Act which particularly applies to them. Part III. enables local authorities to build lodging-houses, an expression which includes separate houses or cottages for the working classes. In rural districts the local authority is the district council, which may, with the sanction of the county council, acquire land, compulsorily if need be, build, let, regulate, and if necessary sell again, houses for working men, raising the money for these purposes by a rate levied on its district, or on such portion of it as may appear just. There are various reasons why rural districts should not hitherto have availed themselves of these provisions. Most of our villages are peopled by agricultural labourers and afford habitations to a diminishing rather than an increasing population, while a large proportion of them are "close" villages. With regard to this term we cannot do better than cite two quotations made in the report before us from a document published by the Royal Commission on Labour of 1892–93. They are: "In villages which are owned, chiefly or entirely, by one landlord, or where cottages have been provided as part of the equipment of a landed estate for the housing of those who work on that estate, the cottages are almost invariably superior in character to those in open villages, or wherever they are held apart from land, and of owners who depend to some extent upon cottage rents for their living." "The action of the local sanitary authority, though vigorous in some districts, is in many places ineffective, and it is everywhere impeded and sometimes arrested by the knowledge that the owners of insanitary dwellings have not the means to remedy the defects, and that the consequences of closing such dwellings would be to make the present inhabitants homeless." Spratton, we may add, is not a "close" village.

At the meeting of the Northamptonshire County Council the idea of a local body supplying dwellings for the working classes in a rural district found one or two strenuous opponents, some of whose arguments have force, although we cannot think that they ought to prevail, but the landed interest as represented on the council found an enlightened spokesman in Lord SPENCER, who strongly supported the resolution put forward on behalf of the village under discussion. His lordship professed a warm interest in the experiment about to be made, referred to his observation of the needs of rural districts in Ireland, and pointed out that as far as Northamptonshire went his own interests as a ratepayer were largely affected by the subject of discussion. His liberal-minded advocacy of the needs of Spratton had no doubt considerable effect on the result of the debate, which ended in the resolution for the issuing of the necessary certificate to the district council being carried by a large majority. Spratton appears to be a good instance of what is known as an "open" village. Its 187 dwellings, of which 147 are cottages, are said to be owned by no less than 83 different persons, some of them quite unable to spend money on improving their property. The majority of the insanitary tenements were originally erected by squatters whose occupation of neglected land by the roadside had been acquiesced in until it became too late to dispute the ownership. Anyone acquainted with common lands in England where there is anything to support a population will recall instances of squatters' cottages and will have noted their inadequacy as dwellings. Frequently a neighbouring landlord bears the blame dealt out by hasty observers with regard to them. Of the cottages in Spratton five were reported as beyond being made fit for human habitation and four of these were overcrowded, while of 11, of which three were overcrowded, it was thought that they might be made inhabitable by repair. The remedy proposed for this state of affairs and now to be adopted includes the allowing of two months to the owners of the dwellings capable of repair in which to make them decent and sanitary, with the alternative of having them compulsorily closed; while in the case of the others a similar period is to be allowed to the tenant to find accommodation elsewhere, and they are then to be closed. Meanwhile the Brixworth District Council will raise the necessary funds in order to replace them with cottages of its own.

In the report already referred to, which was made by Mr. C. K. WOOLSTON, an alderman of the Northamptonshire County Council, with assistance, which he gratefully acknowledged to the council, from Mr. C. E. PAGET, the county medical officer of health, we note among the cogent reasons laid before the council to aid them in arriving at their decision the statement that no evidence was gathered by Mr. WOOLSTON to show that any plans for new cottages had been submitted to the local authority for approval, or that there was any intention on the part of any person to erect such cottages, or that any improvement of existing dwellings was in progress or in contemplation by their owners. We ought, perhaps, to add to what we have said about Spratton as an "open" village that its inhabitants are not purely agricultural or engaged in one pursuit; some of them are connected with working ironstone, a few with the railway, and one seems to be a bootmaker at Northampton. Good cottages are not "paying" property and the landlord who provides them as accessory to the occupation or working

of his land is not necessarily able or willing to supply them for the use of men not employed in connexion with his own estates. In such instances, or in cases where the landlord (or landlords, should there be many) is neglectful or impecunious we conceive that it is the duty of the district council to obtain for the working men within its area suitable, sanitary, and inexpensive homes, and we recommend to district councillors in general the consideration of the action of their congeners in Brixworth. The guardians of this locality, we note, rendered aid to the Commission on Labour in 1892 by the "very complete tables" which they furnished for its information and an intelligent and liberal spirit would seem to prevail here with regard to questions affecting the public health and welfare.

THE subject chosen this year by Dr. F. J. WALDO for his Milroy Lectures, which have just been delivered before the Royal College of Physicians of London, is one full of interest and importance in preventive medicine. Epidemic diarrhœa, to choose one of its many synonyms, is a chief cause of the vast infantile mortality that has hitherto eluded the control of the public health reformer. It has not shared in the decrease that has taken place in this country in plague, cholera, tuberculosis, typhus fever, and small-pox, but has maintained its rate of mortality. A point brought out clearly by the lecturer was that its incidence was not necessarily influenced by the factors favourable to the spread of enteric fever—an observation of some moment when we consider the strong analogy that exists between the two diseases.

Epidemic diarrhœa has well-marked peculiarities which point to special methods of origin and distribution. Among them may be mentioned its main occurrence in the third quarter of the year, the terrible mortality it causes in children under five years of age, its urban incidence, and its prevalence in dry summers. One of the most interesting discoveries in its etiology was the demonstration by the late Dr. BALLARD that the summer rise of the disease did not commence until the mean temperature recorded by the four-foot earth thermometer reached somewhere about 56° F. To this observation Dr. WALDO added one of almost equal significance in demonstrating the local distribution of the malady in counties. From the analysis of a vast array of statistics he arrived at the conclusion that diarrhœal diseases were first and foremost the result of strictly local conditions. To put the matter in another way, the great variation in the diarrhœal death-rate in different districts of one and the same county excludes climatic conditions as the essential factor in causation. Another suggestive feature in the history of the malady is the fact of its vastly greater incidence upon hand-fed as compared with breast-fed infants. With regard to the ultimate origin of the disease Dr. BALLARD suggested the presence of a specific microbe or microbes with a probable habitat in the superficial layers of the soil. The theory now generally accepted is that epidemic diarrhœa is the result of the invasion of one or more micro-organisms, such as the proteus vulgaris, and various micrococci and bacilli, while several constant bacteria of the human intestine appear at times to acquire pathogenic properties. Our knowledge of the bacteriology of epidemic diarrhœa, however, is still in an imperfect condition and its prosecution is surrounded with great technical difficulties. Dr. WALDO has now come forward with a theory of causation that is in some respects novel, though he does not claim originality for it. He suggests that epidemic diarrhœa is probably due in no small measure to the pollution of street-dust by horse-dung. The chain of proof is admittedly imperfect, but it must be admitted that the theory explains many of the peculiarities that mark the natural history of the disease. Dr. WALDO'S words in his Milroy Lectures were: "In casting around for a possible source of what may be regarded as a manifold infection of epidemic character the idea occurred to me, as it has to others, that organically polluted dust might be the vehicle of distribution. A further consideration of the circumstances of the case led me to form the opinion that horse-dung may be the specific polluting material." The composition of the dust of towns—and it must be remembered that it is only in towns that epidemic diarrhœa is rife—plainly differs from the dust of country roads in one important particular—namely, in the infinitely greater proportion of horse-dung which it contains. With the wonderful power of penetration possessed by dust we are all familiar. It is universally diffused through every part of the town-dweller's environment and presumably where it goes it carries any organic germs with which it may have been charged. If the bacilli present in dry horse-dung will cause diarrhœa Dr. WALDO'S supposition becomes feasible. The theory also explains why hand-fed children suffer especially. Milk, which forms the staple article of infantile diet, is freely exposed to invasion by town dust, both in the shop of the retailer and in the larder or cupboard of the consumer. As dust the contagious material would settle on surfaces or float in the air, and in either case would be washed away by rain, a fact that accounts for the diminution of diarrhœa in wet summers.

While on reflection it appears that other points in the etiology of the disease may be cleared up by assuming the cause to be the aerial distribution of dust charged with the infections of horse-dung, we do not need to be convinced of the correctness of the theory to approve of any pathology by which impetus will be given to the progress of street sanitation. The desirability of wide streets with smooth, impermeable roadways capable of frequent flushing, always apparent to medical men, will be more apparent to sanitary authorities after learning the tenour of the Milroy Lectures. The need of frequent and systematic town scavenging will be greatly emphasised, as well as of the absolute supervision of milk supplies from the udder of the cow to the mouth of the consumer. The necessity of approximately dust-proof larders will be evident, and even the substitution of mechanical for horse traction will be advanced. Whether the theory be ultimately established or otherwise it cannot fail to attract attention to the importance of street sanitation and the domestic storage of food. We hope to publish in full in early issues of THE LANCET Dr. WALDO'S Milroy Lectures.

Annotations.

"Ne quid nimis."

WINDOW CLEANING AND FLASH-LIGHTS.

ON March 20th the London County Council passed some by-laws which the Home Secretary has intimated his intention to approve. They deal with the custom of servants or other employés standing on window-sills for the purpose of cleaning windows or for any other purpose, at any height over six feet from the ground without a sufficient support. The penalty for breach of this by-law is fixed at £5 for the employer and £1 for the employé offending. The second by-law deals with those abominations which have recently come into use for advertising purposes—namely, flash- and search-lights. We have on previous occasions[1] expressed our opinion of these things and are sincerely glad to see that the Council has at last put its foot down. The following are the by-laws on lights:—

No person shall exhibit any flash-light so as to be visible from any street and to cause danger to the traffic therein. Nor shall any owner or occupier of premises permit or suffer any flash-light to be so exhibited on such premises.

"Flash-light" means and includes any light used for the purpose of illuminating, lighting, or exhibiting any word, letter, model, sign, device, or representation in the nature of an advertisement, announcement, or direction which alters suddenly either in intensity, colour, or direction.

No person shall exhibit any search-light so as to be visible from any street and to cause danger to the traffic therein, nor shall any owner or occupier of premises permit or suffer any search-light to be so exhibited on such premises.

The expression "search-light" means and includes any light exceeding 500-candle power, whether in one lamp or lantern or in a series of lamps or lanterns used together and projected as one concentrated light, and which alters either in intensity, colour, or direction.

Any person who shall offend against any of the foregoing by-laws shall be liable for every such offence to a fine not exceeding £5.

We really seem to be getting within measurable distance of the time when London will be a comfortable city to live in. The by-law to stop street shouting which was passed upon Feb. 6th has now, we presume, become law. The German band, however, still flourishes, and the hawkers of newspapers still make night hideous with their unveracious screeching. But we are a slow-moving nation and cannot expect too much at once. Meanwhile, let us be thankful for what the London County Council has already done.

QUALIFICATIONS OF PUBLIC ANALYSTS.

UNDER the amended Sale of Food and Drugs Act a wider interpretation to the word "food" is given. The term now embraces any article which ordinarily enters into or is used in the composition or preparation of human foods, including flavouring matters and condiments. This will considerably increase the work of the public analyst and it is all the more necessary, therefore, that all future candidates for this position should possess suitable qualifications. The Local Government Board have for some time had this matter under consideration and have now issued a statement of their requirements in this respect. Intending candidates for public analyst appointments will now, if they have not previously held such an office, have to furnish proof of competent skill in, and knowledge of, analytical chemistry, therapeutics, and microscopy. To meet these requirements the Institute of Chemistry has added a special examination in therapeutics, pharmacology, and microscopy to be taken in conjunction with the analysis of food and drugs section of their final A.I.C. examination. The possession of this certificate together with the diploma of Fellowship or Associateship of the Institute has now been definitely accepted by the Local Government Board as sufficient evidence that the holder possesses the knowledge necessary for the office of Public Analyst. The value of microscopy in every class of analysis has been so long recognised that it should certainly form an important part of the training of analytical chemists. A general knowledge of therapeutics and pharmacology is desirable, not to say essential, for a public analyst, but it should be borne in mind, nevertheless, that he is not in any sense a medical man. Any questions of a therapeutic character based on the results of chemical analysis should be referred to the medical officer of health of the district concerned. In this connexion it is to be hoped that the number of samples of drugs taken under the Act will in the future be largely increased, as the purity of medicaments is of the utmost public importance.

[1] THE LANCET, Oct. 22nd, p. 1077, and Nov. 26th, 1893, p. 1413.

THE AFTER-EFFECTS OF UNSEXING ANIMALS.

IN the *Veterinary Journal* for February there are two interesting articles upon this subject. One, written anonymously, treats of the subject in a general way, and the other, a paper read by Professor Hobday before the Lancashire Veterinary Medical Association, deals particularly with oöphorectomy in the mare. On the smaller animals—such as the pig, the sheep, the dog, and the cat—the operation has been practised for many years, but the unsexing of the females among the larger animals has been allowed to fall into disuse in England until somewhat recently. It is practised upon mares which are continually in œstrum, those which have nymphomaniac tendencies, and upon those which are pronounced kickers. In America it is done upon racing mares in order to ensure that they can be kept in good condition and can be brought to the starting-post without fear of œstral troubles when amongst other horses. For hunting mares of uncertain temper and known to be excitable and dangerous in the field it possesses the same value. According to the observations of Professor Hobday, who practically demonstrated the operation on a vicious mare before the members of the Lancashire Association, the vaginal method of operating is by far the best from all points of view, and the ultimate improvement in temper is much more likely to ensue in a young animal than in an old mare in which the habit of kicking has become firmly established. On the stallion the effect of the removal of the testicles in rendering the animal more docile and tractable for the service of man is too well known to need comment. Calves are usually unsexed when they are a few months old; the operation upon the female is then performed through the flank, but this operation is not regularly practised except in certain districts. The object is to make them fatten more quickly. In heifers and milkers the vaginal method is the best; with the latter the objects are to prolong and increase lactation, to cause the animals to fatten quickly, and at the same time to render the meat more palatable for human food. The average of successful results is very good. The pig is almost always operated upon when young; in some counties, particularly in Norfolk, Suffolk, and Essex, many dealers will not buy female animals that have not been spayed. The operation is often done by a travelling gelder, and so expert do these men become that it is no uncommon thing for the whole process, from the time when the incision in the flank

is made until the wound is completely sutured, to occupy only 30 seconds, both ovaries and horns of the uterus being removed during that time. No antiseptic precautions are taken and the percentage of deaths is practically *nil*. It is a commonly accepted idea that unsexed pigs fatten better, that their flesh is more palatable, and that the bacon takes the salt better than when the animal is entire. In the sheep the male lambs are castrated, oöphorectomy in the female having completely fallen into disuse not only in England but on the Continent. The males of the canine and feline varieties are operated upon in order to curtail their wandering propensities and also in the case of the cat to do away with the very objectionable odour of the urine of the uncastrated "Tom." In the females oöphorectomy, or frequently ovaro-hysterectomy, is performed in order to keep her from attracting friends of the opposite sex and prevent the consequent multiplication of species. Avoidance of the latter point can always be ensured, but if the bitch or cat has once had young ones or even been in œstrum this troublesome period is apt to occur again once or twice, although as a rule it is not so prolonged as when the ovaries are present. In the female cat, particularly the long-haired breeds, there is another advantageous sequel in that they do not change their coats twice a year in the same manner as before; they remain in good coat at a time of year when other cats are losing their hair and generally looking out of condition. It has been said that the unsexed dog and cat become fat, lazy, and useless for all work, but both writers in this number of the *Veterinary Journal* assert that this is not the rule if the animals are properly dieted and exercised afterwards. The after-effect of the operation upon the shape of the head and neck is curious. The castrated male always takes the form of the female, the spayed female not being noticeably altered in appearance except in the case of the cat; in this animal an unsexed female, if operated upon when young, will often develop the head, size, and form of an uncastrated "Tom" In pheasants, too, it is said that a hen bird will acquire cock's plumage if the ovarium is pricked or twisted. What can be the cause of the influence exercised by the generative organs on these points, and why should not emasculation have the same effect on the shedding of the male cat as on that of the female?

A TESTIMONIAL TO THE RESIDENT MEDICAL OFFICER OF ST. GEORGE'S HOSPITAL.

FOR 25 years as resident medical officer at St. George's Hospital Mr. F. J. Marshall has exercised an influence at that institution not necessarily associated with his official post. In addition to the general supervision which he exercises over the working of the hospital he has been throughout the guide, philosopher, and friend of every house physician and house surgeon who has held office during this period. It is not surprising, therefore, that the past and present residents of St. George's Hospital decided to commemorate Mr. Marshall's completion of 25 years service at the hospital. In furtherance of this object a dinner was held at the Café Royal on March 14th when Mr. Marshall was the guest of between 60 and 70 of his friends, every one of whom owed him some debt of kindness, hospitality, or advice incurred during the last 25 years. Dr. A. P. Sherwood of Eastbourne was in the chair by right of seniority, and the company included many of the surgeons and physicians to St. George's Hospital who had been in residence at various periods during Mr. Marshall's occupancy of office. Mr. W. H. Bennett and Mr. Adams Frost were two of the four residents holding office when Mr. Marshall first went to St. George's, and those of later date included Dr. Lee Dickinson, Dr. Cyril Ogle, and Dr. A. C. Latham and Mr. George Turner, Mr. Marmaduke Sheild, Mr. H. W. Allingham, Mr. W. C. Bull, Mr. H. B. Grimsdale, and Mr. F. Jaffrey, to mention those only who are on the staff at St. George's Hospital. The chairman in a capital after-dinner speech described the apprehension with which the advent of a resident medical officer was viewed by the residents 25 years ago and the steps taken to insure his discomfort, steps hurriedly retraced when at the end of a few days it was realised that "one of the best fellows in the world" had taken up his abode at St. George's Hospital. Telegrams were read from past residents now at Wynberg Base Hospital, South Africa, from New Zealand, and from other quarters of the globe. At the conclusion of his speech the chairman presented the guest of the evening with a cheque for 100 guineas, which with a set of silver candlesticks and silver and onyx "pool," represented the testimonial. Mr. Marshall made a cheery and characteristic reply and, the ordeal of photography having been safely passed through, the company separated.

THE CEREBRAL SYMPTOMS OF TYPHOID FEVER.

NERVOUS and cerebral symptoms assume an important place in the symptomatology of typhoid fever and their frequency has led to the name Nervenfieber, which is one of the German synonyms for this disease. Headache is extremely common, while delirium and even acute mental confusion may be not infrequently present. The stage of convalescence may also be marked by attacks of nervous depression and exhaustion, and Professor J. M. Da Costa recently exhibited a case which had been free from notable nervous disturbance during the illness, but in which during the period of convalescence and about a week after the fever had subsided mild nocturnal delirium had set in, with mental confusion and hallucinations which, however, disappeared during the day. This condition eventually disappeared under suitable tonic treatment (syrup of hypophosphites with strychnine) and the ingestion of small quantities of alcohol (whisky) with food at short intervals. Dr. Thomas Claytor, Professor of Clinical Medicine at the Columbian University (D.C.), reports three interesting cases of general convulsions occurring as a cerebral complication of typhoid fever.[1] The infrequency of general convulsions may be gauged by the fact that Murchison in his classical work "On the Continued Fevers of Great Britain" states that of 2960 cases of enteric fever admitted to the London Hospital in eight years convulsions occurred in only six cases. Dr. Claytor's cases are as follows. Case 1.—The patient was a private soldier, aged 26 years, who was attacked with fever, headache, diarrhœa, and epistaxis in the Cuban campaign. He was admitted to hospital on the twentieth day of his illness, the temperature rising on occasions to nearly 106° F. He was slightly delirious at times. Numerous large abscesses on the body and the limbs followed subsidence of fever, and these were freely incised and evacuated. He was on the road to recovery and on the thirty-fourth day of his illness "while apparently asleep he uttered a sharp cry, threw up his hands, and went into a slight general convulsion. The eyes were fixed and glassy; there was slight frothing at the mouth for a few seconds." He remained unconscious for ten minutes, and on recovering he said that he felt as though he had been dreaming. On the fiftieth day of the illness (convalescence having been established) he had a second and more serious seizure. "While sitting up in bed eating his supper he suddenly uttered a sharp cry, threw up his hands, fell over on his right side, and went into general convulsions." The convulsive movements were followed by a period of rigidity

[1] Philadelphia Medical Journal, March 3rd, 1900.

with the head and shoulders bent forward. In from 12 to 15 minutes the forearms were flexed and raised to the head, and slight twitchings with grinding of the teeth and drawing of the face to the left followed. The patient lay on his right side all night with the head and shoulders bent, the legs and thighs flexed, and the arms rigidly set in the attitude mentioned, and any attempt to change the position caused a return of the spasms. The jaws were firmly set and feeding was only possible by a tube passed into the œsophagus through the nose. He gradually recovered and was well in a few days. Case 2.—A young soldier, aged 24 years, had enteric fever, and on the twenty-seventh day he became unconscious and had slight general convulsions. The breathing was very slow (four respirations per minute) and there was blood in the stools. Baths were frequently given and he ultimately recovered. Case 3.—The patient, aged 27 years, had intercurrent relapses of typhoid fever, lasting in all three months. There were delirium and profuse sweating on August 30th, 1899, followed by generalised convulsions on the next day with loss of conciousness. Eventually the patient recovered.

HONOURS TO THE MEDICAL PROFESSION.

UNIVERSAL satisfaction will be felt throughout the profession by the announcement made in the *Gazette* of March 20th that the Queen has been pleased to appoint Lord Lister to be Serjeant-Surgeon in Ordinary to Her Majesty, in the room of Sir James Paget, Bart., deceased. Mr. Frederick Treves has at the same time been appointed one of the Surgeons Extraordinary to Her Majesty. Lord Lister's three immediate predecessors in this distinction were, in the inverse order of their periods of office, Sir James Paget, Sir William Fergusson, and Sir William Lawrence, men everywhere recognised as among the foremost representatives of British surgery. Sir William Fergusson, whose eldest daughter has just passed away (March 16th, 1900), was serjeant-surgeon from 1867 till his death in 1877. The Queen has usually had two serjeant-surgeons, but on the death of Sir Prescott Gardener Hewett in 1891 no successor to him was appointed, and Sir James Paget, who was raised to this dignity in 1877, remained up to the end of his life the only serjeant-surgeon.

HEAT APOPLEXY IN THE ARGENTINE REPUBLIC.

LETTERS received from Buenos Ayres state that the average shade temperature in the city was about 90° F. for nearly the whole of the month of January, a maximum of 104° having been registered on several afternoons. This was 10° above the average of the last 16 years and there was no rain and very little dew. This wave of heat culminated on Feb. 4th in a shade temperature of from 98° to 104° F., a low barometer, and over 50 per cent. humidity. An extraordinary mortality began to occur on Feb. 3rd and 4th, when of a total of 226 cases of "heat stroke" attended by the Assistance Publique over 80 died, most of them dropping dead in the streets as if struck by lightning. At 2 P.M. on Feb. 4th there were 50 dead bodies in heaps in the "patios" (yards) of the central office. On Feb. 5th and 6th the great heat continued and over 200 cases of sunstroke were registered. On Feb. 7th 296 cases were attended, but there were only 10 deaths. Up to 5 P.M. traffic was practically suspended in the streets which had a deserted, plague-stricken look. All Government offices, banks, and large establishments reduced their hours of work and no outdoor work was allowed between 12 noon and 4 P.M. The Government, moreover, appointed a committee of medical men to inquire into the remarkable mortality. Several meetings were held and the unanimou opinion of all the members of the committee was that the character of the attacks which proved fatal in so many cases during the five days Feb. 3rd to Feb. 8th proved that it was merely *coup de chaleur*, and that the high mortality had nothing whatever to do with the sporadic presence of the bubonic plague in the republic. Buenos Ayres enjoys a temperate climate and for 40 years, the period over which scientific meteorological observations extended, such great heat as that of the beginning of last February has been unknown. Hence the many deaths of the first day. The public and the sanitary authorities were unprepared. Very few of the better class succumbed, although many were attacked, and the high mortality among the poor might be put down to ignorance and dread of the plague. Feeling suddenly ill they were afraid to call medical aid, which, if they had plague, would mean instant removal to hospital and isolation of their homes. The municipal authorities, in conjunction with the Board of Health, are taking steps to increase the water-supply, to establish free baths for the poor, and to limit the hours of work during the summer season. The fortnightly report of the Municipal Statistical Bureau for the period from Feb. 1st to Feb. 15th of course included the time covered by this great "heat wave," and consequently presented some remarkable figures. In Buenos Ayres, a city of 795,000 inhabitants, there was a total of 1110 deaths during the period in question; of these 121 were attributed to "insolacion" (sunstroke) and occurred on dates as follows:—On Feb. 1st, none; on Feb. 2nd, five; on Feb. 3rd, 29; on Feb. 4th, 52; on Feb. 5th, 10; on Feb. 6th, six; on Feb. 7th, 10; on Feb. 8th, six; on Feb. 9th, three. The mortality from this cause then came to an end. The largest number of deaths entered under any one heading in the list was 196 attributed to cerebral congestion and hæmorrhage; under the other headings 86 deaths were attributed to "meningitis cerebral," 14 to tetanus, 48 to organic heart disease, 28 to endocarditis and myocarditis, and 184 to diarrhœa and enteritis. The daily deaths from all causes were 104 on Feb. 1st, 124 on Feb. 2nd, 181 on Feb. 3rd, 197 on Feb. 4th, 79 on Feb. 5th, and 51 on Feb. 6th.

ANTI-VACCINATION TACTICS.

THE National Anti-Vaccination League is a body which possesses a vast amount of experience, is extremely energetic, and is not over particular as to its methods. In view of the forthcoming census the Bristol Branch of the Anti-Vaccination League has put forward a circular headed "Vaccination Census, 1900." This heading is obviously meant to insinuate that the Government is about to make an inquisition into the condition of the populace solely as to whether they are vaccinated or no. This point, however, may pass for the present and we may go on to consider the rest of the circular. It proceeds: "With a view to ascertain the feeling of the public in the District Ward as to vaccination and its compulsion you are respectfully requested to fill in 'Yes' or 'No' to the following questions. 1. Do you believe in vaccination? 2. Are you in favour of its being compulsory? 3. Do you consider your Member of Parliament should support a Bill to abolish the present practice of compulsory revaccination as a test for soldiers, sailors, police, school-teachers, post-office employés, and every other branch of the public services? 4. Have you met with any cases of injury arising from the use of the new glycerinated calf lymph? If so, please state particulars. Name. ..... Address. ..... Remarks. ....." This document is to be filled up and to be handed to the collector. A correspondent who sends us one of these circulars, which he has filled up, sends us also three leaflets, which he says are issued as supplementing the polling paper. One of these leaflets is comparatively innocuous, being

merely instructions as to obtaining exemption under the recent Act. The leaflet, however, omits to state that the applicant must satisfy the magistrate that he has a conscientious objection. Merely saying that he has is not enough. Leaflet number two contains information about the legal hours for serving notices and leaflet number three is a reprint of some remarks by the Rev. Hugh Price Hughes. Mr. Hughes's state of mind is exemplified by the fact that he feels, "as a Christian, the strongest *a priori* objection to a system which is essentially a compromise with evil. A physician of the body has no more right to enter into a compromise with disease than I have as a physician of the soul to enter into a compromise with sin." We do not perceive the force of this argument, but it is in no way fair to take a poll of the opinions of persons more or less ignorant and to try to bias their minds by distributing statements of this sort. Mr. Hughes is welcome to his own opinion, but he should not try to bias any other man's conscience or rather he should not allow his opinions to be so used.

LACTESCENT ASCITES OF LYMPHATIC ORIGIN.

AT the meeting of the Société Médicale des Hôpitaux on Feb. 23rd MM. Fernand Widal and Prosper Merklen communicated an important paper on this subject. Many writers have considered milky ascites as of chylous nature on account of the presence of fat capable of being estimated chemically and seen as globules under the microscope. They have pointed out the frequency of cancerous or tuberculous lesions of the abdominal lymphatics and thoracic duct. But others have thought that the fat might be due to degeneration of extravasated substances. In recent years several cases have been published in France of "non-chylous milky ascites." M. Lion first showed that milky ascitic fluid might not contain any chylous elements.[1] In a case of cancer of the ovary he found that the liquid contained an albuminous substance analogous to casein and no fat. M. Achard later published a case in which the effusion contained only a small quantity of fat and innumerable minute refractile granules not coloured by osmic acid and similar to those described in the blood in albuminuria by MM. Widal and Sicard. Finally, M. Apert[2] published an example in a case of heart disease. Under the microscope fatty globules were completely absent and very fine particles were observed only under a very high power. Analysis showed 2·59 grammes of fat to the litre. The distinction between chylous and non-chylous milky ascites presents great difficulties. A small quantity of fat is in favour of a non-chylous form. But in chylous ascites the quantity varies very much in different cases and even at different times in the same case. The kind of leucocytes in the effusion, according to MM. Widal and Merklen, may show the lymphatic origin in certain cases of chylous ascites. The following case is an example. An alcoholic man, aged 50 years, had sub-icteric conjunctivæ, œdema of the lower limbs, and ascites. On tapping the abdomen nine litres of lactescent fluid were removed. Only temporary relief—for 24 hours—was given, the fluid rapidly collected again, and the patient died on the sixth day. Abdominal puncture performed immediately after death gave exit to three and a half litres of lactescent fluid similar to that previously removed. The fluid obtained during life was neutral, of specific gravity 1010, and contained 1·45 grammes of fat per litre. It did not coagulate spontaneously on standing; it became opalescent and a thick whitish sediment settled. Microscopic examination showed no fatty particles, but abundance of leucocytes—90,000 to 100,000 per cubic millimetre. Careful examination with eosin and hæmatein, thionine, and Ehrlich's triacid, showed neither polynuclear eosinophile nor basophile leucocytes. Only uninucleated cells, of which some were of the type of lymphocytes, the others large and medium-sized mononuclear leucocytes, were found. The necropsy showed enlargement and cirrhosis of the liver and softening tubercles at the apices of the lungs. There were no signs of peritonitis and no lesion of the abdominal lymphatics was observed. The presence of only mononuclear leucocytes in the effusion was the important point. These leucocytes could come only from the lymphatics. Thus, in spite of the absence of apparent lesions of the lymphatic vessels, the lymphatic nature of the effusion was shown. M. Merklen has recorded another case of chylous ascites in atrophic cirrhosis of the liver in which no other abdominal lesion could be found.[3] In a number of cases of lactescent ascites which have been recorded leucocytes in considerable numbers have been observed. But a study of the kind of leucocytes present has not previously been made, and consequently its bearing on the pathogenesis of certain cases of milky ascites has not been recognised.

[1] Archives de Médecine Experimentale, 1893, p. 627.
[2] Bulletin de la Société Anatomique, 1897, p. 187.

"THE SEXUAL QUACK."

OUR Birmingham correspondent writes:—"In THE LANCET of March 11th attention is drawn under the above heading, at p. 813, to the degrading practices of the sexual quack as instanced in a pamphlet published in India. It is to be regretted that similar pursuits in this country mark the demoralising tendency of such literature and tend to corrupt the sense of public decency and propriety. One arch-offender in this respect will now have opportunity for reflection in the 12 months' imprisonment imposed upon him at the Birmingham Assizes on March 15th. Before Mr. Justice Darling a man, described as 'Professor Wells,' a public lecturer, was charged with having used obscene and filthy language, and with having published an obscene book at certain lectures delivered by him at the Exchange Rooms. The evidence was incontestable and the punishment was fitly awarded to this pest of society. A considerable amount of warmth and acrimonious criticism by the local press was evoked by the judge's address to the reporters before the case commenced. He warned them as to the discretion to be used in regard to the publication of the details, and told them that although for many purposes they were protected in doing so there was absolutely no protection to a newspaper for publishing offensive or indecent or obscene details, and any newspaper that did it might just as easily be prosecuted for it as anybody else. This severe warning has been regarded as uncalled for and unnecessary in a well-conducted and honourable press."

STATUS THYMICUS.

DR. M. LAUB looks upon certain cases of loss of consciousness with coma supervening in young people as due to a condition associated with persistence of the thymus gland which is designated status thymicus. In a recent issue of the *Wiener Klinische Wochenschrift* (No. 44, 1899) he records the following interesting cases. The first case was that of a youth, aged 17 years, who was taken to hospital at midnight in an unconscious state, the breathing being stertorous, the face cyanotic, and the lips covered with froth. The pulse was scarcely perceptible, the pupils were contracted and irresponsive to light, and the knee-jerks were abolished. Unilateral convulsions, commencing in the right hand, occurred at intervals of from 15 to 20 minutes. The urine was free from sugar but contained a little albumin. The patient continued in a comatose state and died at noon the following day. The necropsy revealed a persistent

[3] La Semaine Médicale, 1897, p. 181.

thymus weighing 19 grammes, multiple hæmorrhages in the lungs, and small miliary hæmorrhages in the neighbourhood of the fourth ventricle of the brain. The spleen was hyperplastic and the heart and aorta were hypoplastic. The second case was that of a youth, aged 18 years, who was taken to hospital in an unconscious state with a full, strong pulse and a cyanosed face. The urine was albuminous with traces of acetone. Death followed in a few hours and the necropsy revealed an enlarged thymus and spleen. The lymphatic glands were hypertrophied and there was some œdema of the brain and the left lung. The third case was that of a young man, aged 23 years, who was admitted to hospital in a similar state. There was a history of alcoholic excess on the previous night. He survived a few hours and died without recovering from coma. The necropsy showed an enlarged thymus and spleen, while the lymphatic follicles at the base of the tongue were enlarged. The urine was albuminous. A condition of œdema with hyperæmia was found in the brain and meninges and the lower lobes of the lungs showed diffuse lobular pneumonic patches. Case 4 was that of a boy, aged 17 years, who had become unconscious and while in that state had passed his urine and fæces under him. The urine was albuminous and blood-tinged. He died in a few hours without recovering consciousness and the necropsy revealed an enlarged thymus gland, together with swelling of the lymphatic glands and œdema of the brain. There was some trace of inflammation of the small intestine. Dr. Laub thinks that the diagnosis of status thymicus can be made when a young person apparently in good health suddenly falls unconscious with or without any external cause, becomes comatose, and dies in a few hours. The spleen is generally found to be enlarged and careful examination may disclose a similar enlargement of the lymphatic follicles in the naso-pharynx and at the base of the tongue. A slight albuminuria may be present and the necropsy reveals an enlarged and persistent thymus. The exact causation of this condition is still obscure, there being some resemblance to uræmia.

THE DURHAM MEDICAL UNION.

DR. ALFRED COX has issued a pamphlet, reproduced from the *Medical Magazine*, dealing with medical organisation in the north of England and giving a history of the work done by the County of Durham Medical Union. We are glad to note that this pamphlet has been sent to every practitioner in the county of Durham. The author relates that during the last four years nine medical unions have been formed between Newcastle-on-Tyne and Middlesbrough for the purpose of dealing with ethical and economical matters. He adds that the County of Durham Medical Union furnishes an example, probably unique, of a combination of medical men "banded together to work out their own salvation on avowedly trade-union lines." Like the workmen's unions the object of this medical union is to obtain the best possible terms from their employers—by conciliatory means if possible, by a strike if necessary. But there have been painful backslidings. Some of the practitioners who were most anxious for immediate action and who by their impatience precipitated the crisis before the union was sufficiently strong were the first to give way and to break their pledges. The majority of the patients are miners and trades unionists. They generally paid 6*d*. a fortnight and this sum covered the cost of medical attendance for the entire household in each case, estimated by Dr. Cox at an average of four persons, an average which we imagine must be somewhat below the mark. After conciliatory measures had failed a circular was sent out in which the colliery surgeons declared that they would cease giving their attendance unless the subscription was raised to 9*d*. Many of the surgeons imagined that because the miners were themselves unionists they would approve the formation of a union by the medical practitioners. On the whole they did approve, but as they have fought for all the advantages which they have gained they thought it was only fair that they should in their turn and as employers test what amount of fight there was among the surgeons whom they employed. Where a bold front was shown, the miners to a large extent yielded and the amount of 9*d*. is now paid; but when met with timidity and hesitation they refused the increase, and then some of those among the medical practitioners who had been loudest in favour of a strike were the first to give in. So the advantage gained has been only partial, but 200 out of a possible 430 medical practitioners are now in union and good progress is being made every day. The workmen themselves are realising more and more that proper attendance cannot be given to a whole family for 1*s*. a month. The practitioner will either make his attendances and drugs fit with this monthly shilling or, if he does his work conscientiously, then he will be sweated by his patients. Formerly this cheap work was farmed out to unqualified assistants. This is no longer possible and a qualified assistant costs too much. Indeed, Dr. Cox remarks that now no medical man can plead poverty as an excuse, for it is most difficult to get qualified assistants even at the greatly increased salaries which are now paid. Altogether, though there are dark sides to the picture painted, it is in the main a hopeful sketch of the progress partially accomplished and promising greater advance in the early future.

THE STUDY OF TROPICAL DISEASES BY MEDICAL WOMEN.

A LARGE majority of medical women practise their profession abroad, and for the most part in India and tropical countries. It is, therefore, obviously a matter of the first importance that they should have facilities for gaining a knowledge of tropical diseases before leaving this country; for there are numerous diseases practically unknown in England which are endemic in hot climates, and these receive, as a rule, but scanty notice in the ordinary text-book or lectures on medicine. Up to the present the only opportunity for instruction in tropical diseases which has been available for medical women has been the course of lectures delivered by Dr. Patrick Manson at the London School of Medicine for Women. We understand that the committee of the Liverpool School of Tropical Diseases have now decided to admit to their classes qualified medical women on equal terms with men students. We are glad to hear of this decision, and feel sure that many medical women who intend to practise abroad will avail themselves of the great facilities offered by the Liverpool school for gaining a knowledge of the diseases which they are liable to meet with in their intended sphere of work.

THE OPEN-AIR TREATMENT OF TUBERCULOSIS.

THE Royal Medical and Chirurgical Society has issued as a separate publication[1] the full report of the discussion upon the Open-air Treatment of Tuberculosis which took place on Nov. 14th and 28th and Dec. 12th, 1899. There is thus afforded an opportunity for those medical men who are not Fellows of the Royal Medical and Chirurgical Society to make themselves acquainted with the opinions of many of those of their professional brethren who have devoted much time and study to the consideration of the newest—or perhaps we should rather say newly revived—method of

[1] Discussion on the Open-air Treatment of Tuberculosis, Nov. 14th and 28th and Dec. 12th, 1899 (from vol. lxxxiii. of the "Medico-Chirurgical Transactions"). Sold by H. K. Lewis, 136, Gower-street, London, W.C. 1900. Price 2*s*. 6*d*. net.

treating tuberculosis. Nearly all medical writers from the time of Hippocrates downwards have insisted upon the value of pure air and good living as aids to health in the case of phthisical patients, but perhaps Bodington of Sutton Coldfield was the first of our countrymen in modern days to preach a doctrine then neglected but now almost universally received. We dealt fully with the discussion in the leading columns of THE LANCET of Dec. 23rd, 1899 (p. 1746), so we shall merely repeat here that the whole trend of the discussion was to extend the trial of the method, provided such treatment be carried out upon truly scientific and not commercial lines.

UNQUALIFIED ATTENDANCE UPON HOSPITAL PATIENTS.

AN unfortunate incident occurred at Guy's Hospital on March 14th. An inquest was held upon a baby, aged six weeks, who had been brought to the hospital by the mother who in her evidence said that a young gentleman told her that there was nothing the matter with the patient, but that she had better bring the child next day. During the night, however, the baby died. The student who saw the child gave evidence and said that in his opinion he did not think that there was anything wrong except that the child's skin was red. The house surgeon said that it was the custom for dressers to see patients, but the patients were not informed that the dressers were unqualified. Mr. J. Mulqueen said that death resulted from marasmus and congestion of the left lung. The body was very emaciated. Such a course of events should not be possible. The authorities of Guy's Hospital impose the duty of seeing patients in the surgery upon the house surgeons and assistant house surgeons. The dresser failed in his duty in not calling the attention of the house surgeon to the case and has been severely reprimanded. We see that the coroner's jury added a rider to their verdict that patients should be in every case seen by a medical man and that a record should be kept of the prescriptions given. With the first part of this rider we quite agree—except in the case of a patient who comes in to have a cut finger attended to or, as in a case we knew of, asks to have the nails of his right hand cut—but the second part is impossible so long as the present rush of patients of all classes and kinds continues. We mean by this that if any other record is to be kept than the entry on the patient's card or ticket which he or she must preserve a great addition to the staff would have to be made.

ETIOLOGY OF CHOREA.

R. VON KRAFFT-EBING of Vienna[1] has collected 200 cases of chorea, the etiology of which was fairly well ascertained, and found that while 64, or one-third of the cases, were males, 136, or two-thirds, were females. Heredity was distinctly present as a factor, and among other predisposing causes were the changes (in brain and skull) produced by rickets in infancy, and a nervous and irritable constitution. Cranial anomalies were as frequent as in epilepsy, and were in nearly all cases attributable to rickets. Hydrocephalus was relatively common, and in some cases over-exertion and masturbation were found to be contributory causes. In six females out of 136 pregnancy played a causative part. Cerebral concussion was met with as a cause in a few instances. Of the more immediate and exciting causes articular rheumatism and infectious fevers played an important part. Thus in the 200 cases 58 were ascribable to rheumatism, 66 to mental shock, fright, or other trauma, 17 to infectious fevers other than rheumatism, while 59 were due to obscure causes. Shock and fright played a more potent part in patients with a nervous temperament or predisposition, while rheumatic fever seemed to be potent either in the presence or absence of predisposition. Von Krafft-Ebing insists that before the neurotic origin of a case of chorea is accepted an infectious causation should be excluded, and a case is cited in illustration showing that whereas the chorea seemed on inquiry to be of psychic origin—i.e., due to heredity or to mental shock—the post-mortem examination revealed the presence of vegetative or warty endocarditis on the mitral valves, thus showing a rheumatic factor in the origin of the disease.

[1] Wiener Klinische Wochenschrift, No. 43, 1899.

THE SECOND MALARIA EXPEDITION.

THE Liverpool School of Tropical Medicine has organised a second expedition to West Africa for the study of malaria or, to give the disease its newest name, "gnat fever." The members of the expedition are Dr. H. E. Annett, one of the demonstrators at the Liverpool School (who, it will be remembered, went out with the first expedition) Dr. Elliott of Toronto, and Dr. J. E. Dutton, and the party left for Nigeria on March 21st in the *Olenda*. The Colonial Office is giving the party every assistance; a free passage both ways is given by Messrs. Elder, Dempster and Co.; and the African Direct Telegraph Company have also subscribed towards the costs. We shall from time to time publish notes of the proceedings of the expedition. In connexion with this matter we may mention that the Liverpool School of Tropical Medicine has just issued its second memoir. It consists of a report of the malaria expedition of August, 1899, written by members of the expedition, and is copiously illustrated with plates, maps, and micro-photographs. We shall give detailed notice of the work in a future issue.

A VICE-PRESIDENT of the Dental Hospital of London, Leicester-square, has presented £100 as a special donation towards the amount urgently required for re-building the hospital with a promise, provided an additional sum of £800 be collected within a reasonable time, that he will give the remaining £100 to complete £1000. The committee are earnestly appealing for contributions to enable them to avail themselves of this generous offer and donations will be gratefully received by the secretary at the hospital or by the bankers, Messrs. Barclay and Co., Limited, 6, Pall Mall East, S.W.

THE course of ten lectures instituted by the late Professor Thomas Dent Mütter, M.D., LL.D., on Some Point or Points in Surgical Pathology, will be delivered in the winter of 1902–3 before the College of Physicians of Philadelphia. The appointment is open to the profession at large and the fee is $600. Applications, stating in full the subjects of proposed lectures, must be made before Oct. 1st, 1900, to John H. Brinton, M.D., North-east Corner of Thirteenth and Locust-streets, Philadelphia, Pa., U.S.A.

DR. W. S. CHURCH, the President of the Royal College of Physicians of London, has become a member of the Athenæum Club under Rule II., which provides for the election by the committee of nine persons yearly who are distinguished in science, letters, arts, or for public services.

IN THE LANCET of Feb. 24th we mentioned the names of various candidates for the Professorship of Medicine in the University of Edinburgh and also intimated that the name of Professor Osler might possibly be added to the list. Professor Osler has, we learn, sent an application for the post.

THE adjourned debate on the Treatment of Rheumatism was continued on Tuesday evening last at the Chelsea

Clinical Society. Among the speakers were Dr. Pye-Smith, Dr. R. Caton, Dr. Burney Yeo, and Dr. Isambard Owen, while Sir Richard Douglas Powell gave a closing address. We shall publish a full account of the debate next week and hope that there may be some practical outcome of a very voluminous and instructive discussion.

WE are informed that in concluding the winter course of medicine at Glasgow University to-day (Friday) it is Sir William Gairdner's intention to bid farewell to his pupils, as he has decided to resign his position as Professor of Medicine in the University.

THE Midwives Bill Committee of the General Medical Council met on Wednesday last. We presume that it will represent to the Government, which has not yet committed itself to an acceptance of the measure, the omission of its recommendations.

WE regret to learn of the death of Dr. Robert Cory, the Director of the Animal Vaccine Establishment of the Local Government Board and Physician-in-Charge of the Vaccination Department of St. Thomas's Hospital.

DR. H. CAMPBELL THOMSON has been elected to the office of assistant physician at the Middlesex Hospital to fill the vacancy created by the appointment of Dr. W. Pasteur as physician.

THE annual meeting of the Medical Graduates' College and Polyclinic will be held at the College, 22, Chenies-street, Gower-street, W.C., on Wednesday next, March 28th, at 6 P.M.

Dr. HUGH J. M. PLAYFAIR has been appointed Gynæcological Surgeon to the Metropolitan Hospital.

THE DEFECTS OF THE MIDWIVES BILL.

AN ADDRESS BY DR. GLOVER.

AT an ordinary meeting of the Islington Medical Society held on March 20th at the house of Dr. H. F. Stokes, Dr. Glover spoke on the Midwives Bill and the situation now created by the fact that the measure has been read for the second time in the House of Commons. He said:—

You know I have always felt that some legislation on the subject of midwives was inevitable and that the profession could not if it would prevent legislation. There are forces of humanity and forces of social and Parliamentary influence working in this direction which must in the end prevail. From one cause or another there is a considerable section of the female portion of the population which is not attended in confinements by medical men and which is not likely to be. I need not here argue the point. I know there are many who think that the bulk of the profession does not admit this. The Editors of THE LANCET, who have taken great pains to get at the roots of this question, as of others which disturb the normal harmony and quietness of the profession, have found that on a vote of 7250 practitioners in England and Wales 5000 odd are opposed to the Bill, 1547 are in favour of the Bill, and 640 are indifferent. Here, of course, is a large majority against the Bill—not necessarily against legislation of some sort, but against the Bill. But observe, 5000 is only a little more than one-fifth of the profession in England and Wales, leaving nearly four-fifths of its members content to leave the question in the hands of Parliament and the General Medical Council, which has taken what I think is the statesmanlike course of trying to control legislation, which is seen to be inevitable. I myself was in this poll of the profession one of the 5000 objectors to this Bill, because I find in it one great defect which I hope will be supplied, but which, I think, if unsupplied, should be fatal to it. While I think midwives must be accepted as a fact in the present stage of civilisation I do not think that medical sanction should be given to any further legal recognition of them except under clear and strong conditions, the chief of which are: firstly, that they shall be severely restricted to ordinary cases and *natural* labours; and secondly, that clear provision shall be made in any Midwives Act for medical help being available for them and the unfortunate patients, whether mother or child, in whose case any abnormality or irregularity arises.

We are all agreed that the high perfection to which midwifery practice has now attained is due to its being incorporated in the art and science of medicine. The more hopeful of us expect that with the growing intelligence and wealth of the people they will be content with nothing less for mothers than the full skill of complete medical practitioners. And meantime we agree to a recognition of the midwife only as a necessity and as one in touch with, and acting subordinately to, the medical practitioner. There are other and minor points in the present Bill requiring amendment. I leave these to others or to another occasion. But I hope to show that this one is urgent and indispensable if medical sanction is to be given to this measure, and I think we have a right to hope that if medical sanction is not given the sanction of Government will be withheld even at the eleventh hour. The Bill had better wait 12 months longer for this completion than be passed without it. It is a life-and-death measure. The lives of women are at stake and of women who have every claim to our consideration. The Government have shown by their slow action in this matter their sense of the responsibility of such legislation. They refused to entertain the question seriously till the promoters of it had satisfied the General Medical Council on essential points. Here is a point which the Council thinks "imperative" and it is not expressed in the Bill. It may be said that such power of approval of the regulations of midwives' practice is given to the General Medical Council under the Bill as to secure this point. But I deny that. The General Medical Council is not likely to approve any rules which do not include a requirement that the midwife in case of abnormality or emergency shall apply for medical help. But it has no power to help her to get it or to make such arrangements as shall facilitate her getting it. This must be the work of the local authority which is to license the midwife. I need not remind the society that this is the only condition under which maternity charities are conducted safely; in every district there are medical men appointed to whom the midwife can apply. And I am on strong ground here when I argue that the Bill should contain a clause requiring the local licensing authority to appoint and to pay medical men to whom the midwife is to apply in case of emergency, with power of recovering from persons who are able to pay the medical fee. There are two ways of objecting to this demand. One is to say that in an emergency the parish medical man can be summoned. But this is not a Poor-law business and we do not propose to pauperise those whose case is such as to require a medical practitioner. Another form of objection to a clause securing medical help to the midwife is that such a clause imposes a new expense on local authorities. This seems serious and is probably the explanation of the absence of such a provision in the Bill. But it is not tenable, for the Bill already involves the county council in expense for its general purposes. Remember the legislation is altogether exceptional. It deals with a very special question. It is an attempt to diminish the dangers of parturiency among the poor. The Bill brings women with little training and little knowledge into contact with cases which may suddenly require all the skill and knowledge of a fully-trained medical man. The law is bound to be thorough and not to put the midwife into an impossible position. The objection that such a provision of medical assistance to supplement the work of the midwife will cost the local authority a few pounds a year is trivial and is refuted by the Bill itself, which in two or three clauses makes the county councils answerable for supplying any deficiency in funds required for carrying out the Bill. Clause 5 provides that if the fee, not to exceed a guinea, to be paid for examination and certificate by the midwife is inadequate for the expenses of examination and of the general work of the board, the deficiency shall be supplied from the respective local county funds in proportion to the number of midwives

licensed to practice in the said county. Clause 6 empowers county councils to contribute to any deficiency in the funds of the Central Midwives Board. So that the pecuniary liability of the county council is already in the Bill. It is only necessary, under Clause 6, to enact that it shall be also liable for any expenses incurred in procuring necessary medical help for the midwives whom the county council is to license and supervise.

I am supported in this view by the fact that it has been pressed by the General Medical Council repeatedly on the Government as a provision of the Bill without which the Council could not support the measure. The opponents of this Bill allege its inconsistency with the Medical Acts, which regard midwifery as a part of the medical art and prognosticate danger and death to lying-in women. Those who promote it are bound to make it as safe as the system of maternity charities, which has had the sanction of the profession in all ages. With this view I propose that—

I. The term "midwife" in the Bill shall mean a woman who undertakes for gain to attend women in *natural* labour.

II. That a clause be inserted in the Bill requiring the midwife in every case of irregularity or emergency, either of mother or child, to apply for medical assistance.

III. That another clause be inserted in the Bill requiring county councils, as the local licensing and supervising authority of midwives, to appoint medical men in their districts to whom midwives may refer in cases of emergency, and empowering the county council to recover the costs so incurred in a court of law where the circumstances of the patient are such as to enable her to pay.

The above resolutions were carried and it was resolved to forward copies of them to the Members of Parliament for Islington, with a request for their support, and to the Lord-President of the Council.

THE WAR IN SOUTH AFRICA.

THE hour for the relief of Mafeking is drawing nigh if it has not been already accomplished. The nation is justly proud of the brave and spirited conduct displayed by this little garrison and of the pluck and cheery humour of its commander. Without discursing too much into politics we may say that the longer the war continues the more it has become apparent that it has been mainly brought about through the instrumentality and influence of a relatively small, but very active, portion of the two Republican Governments of South Africa operating upon ignorant, credulous, and misguided peoples. The Orange Free State had no cause of quarrel with us and there was no unanimity among the people as a whole in regard to a war from which they had little or nothing to gain even if successful. No sooner had the people an opportunity of exercising their free will in the matter than they began to do so, as may be abundantly seen by what has taken place since Lord Roberts reached Bloemfontein.

The embarkation of troops for South Africa still goes on apace and the number of arrivals of sick and wounded from that country continues. The British and Colonial forces now in South Africa are very large and must soon be so overwhelming as to overcome further resistance, but the march to Pretoria has still to come off and there may still be some severe fighting.

The American hospital ship *Maine* has left Durban with a big batch of wounded. She is the first ship of the kind to leave the Cape since the relief of Ladysmith, and in addition to a number of officers of different regiments she brings home 153 non-commissioned officers and men.

With regard to the extent of the permanently disabling effect of gunshot wounds from weapons used in modern warfare we know that the Mauser rifle is, on the whole, a humane weapon. Mr. Wingfield-Digby recently asked a question in the House as to the actual or approximate number of those who had been already cured of their wounds and were back again at duty. Mr. Powell-Williams said that the figures, but only up to Feb. 2nd, were as follows:—Wounded: officers, 261; non-commissioned officers and men, 4583. Returned to duty: officers, 67; non-commissioned officers and men, 705. These figures do not include casualties in Ladysmith and Kimberley since the investment.

Some returns of the sick and wounded among the Boer troops have been published giving higher numbers than have been furnished hitherto, but we regard them as unreliable and below the number of casualties which have actually taken place.

FIELD FORCE.—SERVICE ABROAD, SOUTH AFRICA.

Table showing the Personnel of Medical Units on the Lines of Communication.

Unit and place of mobilisation.	Names.	Remarks.
No. 11 General Hospital* (Depôt R.A.M.C., Aldershot).	*Royal Army Medical Corps.* Major H. Carr (*a*). " E. J. Lawless. " E. L. Freer. Captain C. F. Wanhill. Lieutenant H. P. W. Barrow. " J. R. Atkinson. " J. K. Tomory. " A. H. McDougall. " J. Clay. Quartermaster and Honorary Lieutenant E. Houghton. *Civil Surgeons.* Mr. P. J. Bodington. " J. M. Coates. " A. P. B. Ellis. " A. Gilmour. " E. G. Goddard. " J. C. Hibbert. " W. H. Rowell. " W. H. Steele. " J. F. Whelan. *Army Nursing Service Reserve* (*b*). Nursing Sister Miss L. Badger. " " " G. Balfour. " " " M. A. M. Borthwick. " " " B. E. Caws. " " " K. M. Denny. " " " E. Evans. " " " A. Fincher. " " " E. Fry. " " " E. Fisher. " " " M. G. Gilmore. " " " F. C. A. Holcroft. " " " V. I. Lamb. " " " H. A. Lawrence. " " " M. O'C. McCreery. " " " G. A. E. Napier. " " " A. F. Plunkett. " " " M. Roche. " " " C. A. Shaw-Hellier. " " " E. A. Snape. " " " K. Ward. (Three female servants.)	134 non-commissioned officers and men (including 45 St. John Ambulance Brigade). One special cook and two warrant officers to join the unit on its arrival in South Africa. Arrangements for charge of x ray apparatus to be made in South Africa.

(*a*) Registrar and secretary, and to act as officer commanding the unit till its arrival in South Africa. (*b*) Superintendent or acting superintendent to be selected from the Army Nursing Service in South Africa, an extra nursing sister being included in this detail to allow of the adjustment.

* The P.M.O. Field Force, South Africa, to detail a Lieutenant-colonel R.A.M.C. in South Africa to command this hospital.

Medical Division, War Office, March 21st, 1900.

(NOTES FROM SIR WILLIAM MAC CORMAC.)

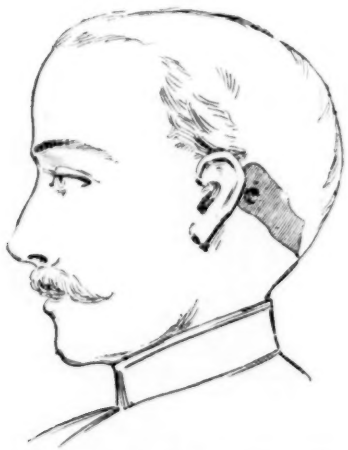
(*Continued from p. 797.*)

THE following are some further notes by Sir William Mac Cormac upon interesting cases of gunshot wounds.

Wound of the head and the back.—Major ——, wounded on Jan. 24th at Spion Kop. There was a shell wound in the head, five inches long by three at the widest part, extending from behind the left ear to the middle line of the nape of the neck. The skull was exposed behind the ear at the base of the mastoid process for a circle of the size of a sixpence (see Fig. 1). There was a transverse wound across the back; the entrance was on the left side five and a half inches from the ninth dorsal spine; the emergence on the right was about five inches from the ninth dorsal spine in a quite transverse direction (see Fig. 2). The entrance and exit wounds are perfectly circular and are not yet quite healed. The officer lost power in his lower limbs for a few days but they have now recovered. There is tenderness over the ninth dorsal spinous process. The head wound is granulating healthily and there are no general symptoms. He is now doing well (Feb. 14th).

Wound of the head.—Private ——, wounded at Spion Kop on Jan. 24th. The bullet entered two inches externally to the anterior extremity of the sagittal suture on the left side. It was cut out from immediately beneath the scalp in a precisely similar position on the opposite side where it lay beneath the scalp. There is complete motor paralysis of the left upper extremity, but sensation is present. The wounds have healed (Feb. 12th). The patient is otherwise well.

FIG. 1.



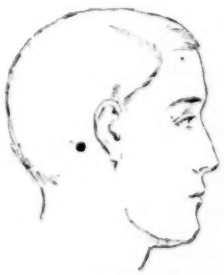
The shaved area shows the granulating wound. At the dark spot the bone is exposed.

Wound of the head.—Private —— of the 2nd Royal Lancaster Regiment was wounded at Spion Kop on Jan. 24th. The entrance wound was just outside and slightly above the left ala nasi (see Fig. 3), that of exit being half an inch posterior to the tip of the right mastoid process (see Fig. 4). After being wounded there was much bleeding from the nose. At present Feb. 12th) the patient is deaf in the right ear. The wounds have completely healed. He says that he feels perfectly well.

FIG. 3.

Entrance wound.

FIG. 4.

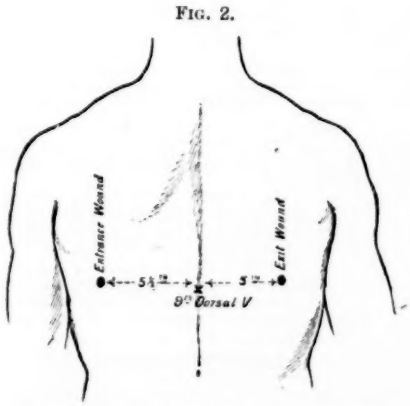


Exit wound.

Wound of the mouth.—Private —— was wounded at Spion Kop on Jan. 24th. The man's mouth was open at the time of the receipt of the injury. The bullet entered the mouth, carried away the whole of the alveolar process and teeth on the right side of the upper jaw, and emerged behind the posterior border of the masseter muscle on the same side. The only remarkable point about the case is that complete aphonia set in immediately after the receipt of the injury. This is now, however, disappearing (Feb. 12th).

Wound of the neck.—Private ——, of Thorneycroft's Mounted Infantry, was wounded by a Mauser bullet on Jan. 24th. The bullet entered through the sterno-mastoid muscle on the left side, about two and three-quarter inches above the clavicle, nearly on a level with the pomum Adami, and rather nearer to the posterior than to the anterior border of the muscle (see Fig. 5), and emerged from the centre of the right sterno-mastoid muscle and about an inch above the level of the pomum Adami (see Fig. 6). A considerable amount of external bleeding occurred on the receipt of the wound, but both wounds are now (Feb. 12th) healed. There was at first paralysis of both arms, especially of the left, but the power is gradually and steadily improving. There is neuralgic pain in the area of distribution of the cervical plexus.

FIG. 2.



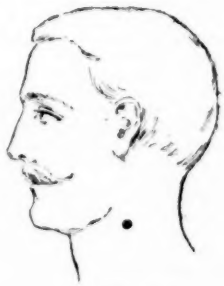
The entrance and exit wounds in the line of the ninth dorsal vertebra.

Wound of the arm, damaging the basilic vein, the median nerve, and the brachial artery.—Private —— dropped his service revolver by accident on Jan. 24th, which discharged a bullet. This entered one and a half inches directly above the internal condyle of the left humerus and lodged beneath the skin immediately posterior to the tip of the acromion process. The lower two-thirds of the arm were occupied by an exceedingly tense swelling, causing much enlargement. There was difference of opinion as to whether pulsation could be distinguished in the tumour, but the radial pulse was lost on that side and anæsthesia and paresis in the area of distribution of the median nerve were present. On Feb. 5th a long incision of four inches was made over the course of the artery from the entrance wound upwards, and this was subsequently extended downwards for one inch in the direction of the bend of the elbow. A large amount of coagulated blood was turned out, much of which had apparently passed between the biceps and the brachialis anticus to the outer aspect of the arm. After some dissection the basilic vein, the median nerve, and the brachial artery were exposed. About three-quarters of an inch

FIG. 5.

Entrance wound.

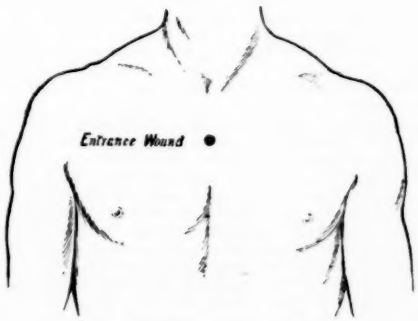
FIG. 6.



Exit wound.

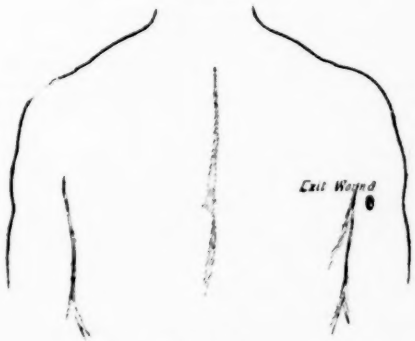
above the wound of entrance a wound was found in the basilic vein, a slit-like perforation (nearly one inch long) in the median nerve, and a large gap in the brachial artery. The vein and the artery were tied above and below the seat of injury. The paraplegia. The patient had no control over the bowels or bladder. Anæsthesia was complete up to the upper third of each thigh (Feb. 12th). There is a bed-sore commencing over the sacrum. The general condition notwithstanding is good.

FIG. 7.



Entrance wound.

FIG. 8.



Exit wound.

nerve was apparently split very obliquely and four-fifths of its substance appeared to be intact; it was consequently not interfered with. Finally, the bullet was extracted; it was unaltered in shape.

Wound of the thorax.—Private —— of the 2nd Middlesex Regiment was wounded at Spion Kop at a range of 800 yards. The entrance wound was exactly in the middle line, about two inches below the notch of the sternum, close to the junction of the manubrium with the gladiolus (see Fig. 7). The wound of exit was at the posterior aspect of the upper arm, an inch externally to, and on a level with, the point of flexion of the arm upon the thorax (see Fig. 8). There was hæmoptysis for two days. At present (Feb. 12th) there is wrist-drop (right), anæsthesia in the area of the ulnar nerve distribution, and great neuralgia in the right arm. The wounds have healed. How did the great vessels escape?

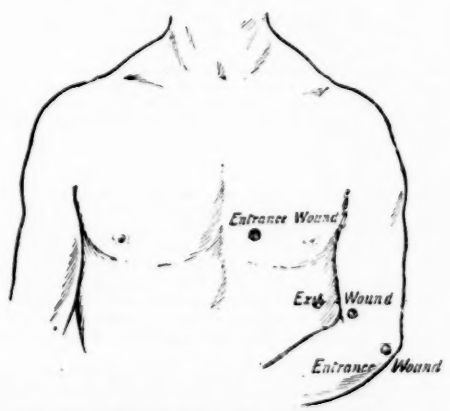
FIG. 9.

Size of entrance wound.

Wound of the thorax.—Colonel —— was wounded by a shrapnel bullet on Feb. 5th. The entrance wound was behind the left shoulder one inch below the spine of the scapula. The wound is now (Feb. 12th) scabbed and healed. The bullet was removed from a subcutaneous position one inch to the right of the base of the xiphoid cartilage. The wound has healed. The patient has spat blood, but to a slight extent, since the injury, and there are some slight dyspnœa and cough. There are also right wrist-drop and loss of sensation up to the elbow (Feb. 12th).

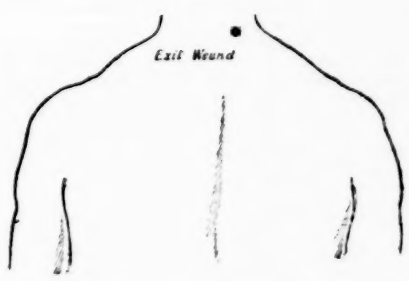
Wound of the lung.—Captain —— was wounded on Jan. 22nd by a shrapnel bullet from one of our own guns which were captured at Colenso. The entrance wound was

FIG. 10.



Shows both entrance wounds and first exit wound.

FIG. 11.



Shows second exit wound.

Wound of the thorax and spine.—Captain —— was wounded on Feb. 5th at Vaalkrantz. The entrance wound was over the ninth rib two and a half inches immediately below the inferior angle of the right scapula, and the exit wound was over the sixth rib in the posterior axillary line on the left side. The wounds have completely healed. There was complete over the junction of the outer quarter with the inner three-quarters of the clavicle, immediately beneath the bone which was grooved but apparently not completely fractured. The bullet was cut out from beneath the skin on the same evening, three hours after the receipt of the injury, in the field hospital, immediately to the left of the fifth dorsal

spine. From the appearance of the bullet and the direction of its track it must have caused partial fracture of the clavicle and possible injury to the ribs and must have traversed the lung. There were slight cough and hæmoptysis for two days with some dyspnœa. Both wounds suppurated freely. The temperature on Feb. 4th was 102° F. On the 5th a small piece of leather (from the patient's belt) came out of the anterior wound. On the 6th the temperature was normal and the patient was much better.

Wound of the lung and the abdomen.—Private —— was wounded on Jan. 24th at an unknown range. The bullet entered at the inner end of the fifth right intercostal space close to the sternum, and it emerged half an inch below the twelfth right rib and two and a half inches from the middle line of the spinal column. There was slight hæmaturia after the receipt of the wound, but there were no other symptoms and the patient is now quite convalescent.

Wound of the upper extremity and the thorax.—Private —— was wounded on Jan. 24th at an unknown range. The bullet first entered the base of the left olecranon process and emerged at the inner border of the tendon of the biceps in front at the bend of the elbow (see Fig. 10). It then entered the chest exactly at the level of the left nipple and one and a half inches internally to it and found an exit through the trapezius muscle at the level of the sixth cervical spine and two inches from the middle line (see Fig. 11). There was pain in the chest at night. The patient had no cough, but he had a certain amount of hæmoptysis. The wounds have healed (Feb. 12th). It is wonderful how the great chest vessels escaped.

A curious incident occurred in the case of Major ——. This officer was wounded by a Mauser bullet in the thigh. The bullet traversed the thigh transversely and had just sufficient energy to perforate the skin at the exit wound, but could not get through his trousers and so fell down between the thigh and the trousers, being picked out at the knee, where the puttee had prevented its dropping to the ground. The bullet must, of course, have come from a very long range.

Wound of the abdomen.—Private —— was wounded on Jan. 24th at a range of 500 yards. The wound of entrance was between the eleventh and twelfth ribs vertically above the centre of the left iliac crest. That of exit was through the right os innominatum about two inches below the centre of the crest. There was anæsthesia of the leg below the left knee, but no other symptoms of any sort, although the bullet traversed the abdomen from side to side.

Wound of the abdomen.—Private —— was wounded on Jan. 24th at an unknown range. The bullet entered at the eighth intercostal space in the mid-axillary line on the right side, its point of exit being half an inch above the iliac crest and two inches posterior to the anterior superior iliac spine on the left side. The patient vomited for one hour after the receipt of the injury. He was constipated for three days. His diet consisted of milk for two days and he has had field rations ever since. The bullet must have traversed the liver and probably the bowel also.

Wound of the abdomen.—Private —— was wounded on Jan. 24th at a range of 700 yards. The entrance wound was opposite the tenth dorsal spine and four inches to the right of the median line, while the wound of exit was immediately over the left iliac crest, an inch posterior to its centre. There was slight dyspnœa for three days, since when there have been no symptoms. There is no evidence of any abdominal injury, although it is difficult to suppose that the intestine could have escaped damage.

Wound of the abdomen.—Lieutenant —— was wounded on Feb. 5th by a Mauser bullet. The extracted bullet (Fig. 12) was found to be doubled up and damaged, apparently from a ricochet. The entrance wound was of large irregular shape, covered with a scab, about one inch by three-quarters of an inch in size and one and a half inches above the anterior superior spine of the right ilium. The bullet was cut out on the day after the receipt of the wound from the centre of the right buttock. This wound is quite healed. There were no symptoms.

FIG. 12.

Extracted bullet.

Wound of the abdomen.—Private —— was wounded at Spion Kop on Jan. 24th. The bullet passed through the left wrist while the man was sitting up drinking. It then entered the abdomen exactly in the middle line, one and a half inches above the umbilicus, in a direction somewhat sloping to the right side. There is no wound of exit. There is difficulty in defecating and in micturating with much straining at stool, but no blood has passed either in the fæces or in the urine. There is considerable abdominal distention (Feb. 11th). No rise of temperature. The wounds have healed and the symptoms are improving.

Wound of the thigh (involving the common femoral artery).—Private —— was wounded on Jan. 24th at a range of 600 yards. The entrance wound was exactly over the common femoral artery, one and a quarter inches below Poupart's ligament. The bullet crossed close to the anterior surface of the femur three-quarters of an inch below the tip of the trochanter major. There is a pulsating swelling in the line of the artery with a marked thrill and loud bruit as if there was a communication between the artery and vein. On Feb. 6th an incision was made extending from about an inch above Poupart's ligament downwards for five inches along the course of the artery. The tissues were found to be much matted together by inflammatory material and after some dissection a gush of blood disclosed the situation of the wounded vessel. The forefinger of one of the assistants being placed in the aperture arrested the bleeding. The common femoral artery, after a troublesome dissection, was exposed above and the superficial femoral artery below the opening and they were ligatured, but the bleeding still continued. It was then found that the vein had also been lacerated. This was isolated above and below and ligatured in two places, but still the hæmorrhage continued immediately the finger was removed—apparently from the profunda artery—the main vessel having been traversed just where that trunk is given off. After considerable difficulty this also was secured. Mr. Hulke performed the operation and I and others assisted him. There was no extravasated blood or clot found throughout the operation though the wound in the vessel was as large as the end of the forefinger, which is sufficiently remarkable, and there was no evidence of backward pressure in the vein although the opening in the vein and artery appeared to communicate. This man subsequently died.

Wound of the thigh involving the femoral artery and vein.—Private —— was wounded on Jan. 21st at an unknown range. The entrance wound was exactly at the middle of the posterior aspect of the right thigh, and the exit wound was at the junction of the lower and middle thirds of the same thigh, on the inner side, in the line of the femoral artery. There was increased pulsation with some swelling which involved the area of the exit wound. There was no bruit. Pulsation was to be felt in the dorsalis pedis and posterior tibial arteries. An operation was performed on Jan. 29th. An incision about six inches in length was made over the course of the artery, the exit wound being a little below the centre. On laying open Hunter's canal there appeared to be no extravasated blood or clot, but considerable hæmorrhage took place from a wound half an inch in length on the anterior aspect of the artery and in its long axis. The aperture in the vessel was of irregular shape and was situated an inch above the opening in the adductor magnus. The hæmorrhage was arrested by pressure in the wound and the artery was isolated above and below and ligatured. The skin wound was then sutured. The temperature on the night of the operation was 101° F., but it fell to normal on the next morning and has remained so ever since. On Feb. 6th (the first time of dressing the wound) the stitches were removed. There was a little sanious discharge but the wound had completely healed, with the exception of about one inch in the vicinity of the exit wound. The collateral circulation in the limb has been fully established and the patient is otherwise quite convalescent. It is remarkable that in this as in several other instances there should be little or no bleeding into the tissues from a large wound in a large artery.

The injuries here noted were received about the same time (Jan. 24th) and their condition is described on Feb. 5th and 12th. The men were mainly all convalescent and most of the wounds had healed under a scab. With the exception of the case of injury to the brachial artery and median nerve the cases of abdominal injury and the chest injuries are further instances of the extraordinary recoveries which follow damage of this nature inflicted by the Mauser bullet. It is curious also, as in two other similar cases, that the Mauser bullet can split a nerve of the size of the median nerve without severing it.

Another remarkable feature is absence of extravasation in

the case of the wound of the common femoral artery and profunda artery, and the same was the case in the injury implicating the femoral artery in Hunter's canal. How in one case the vessels at the root of the lungs and in another those arising from the arch of the aorta escaped is nothing short of an anatomical puzzle.

These cases are selected from amongst many in the hospital at Mooi river which is doing most excellent work under the direction of Colonel J. A. Clery, R.A.M.C. The succession of cases from the front has been almost daily during the past weeks and the proportion of serious cases amongst them is very large.

WILLIAM MACCORMAC.

(FROM OUR SPECIAL CORRESPONDENT AT THE BASE.)

This morning news that Cronje was a prisoner in Lord Roberts's camp, though of course stale to you by this time, has been received by everyone here with feelings of intense satisfaction and has, I am sure, acted a great deal better than all our "tonics" to the majority of the sick and wounded at present filling the hospitals. As regards my own charges I can only say I had great difficulty in restraining them all, amputation cases included, from demanding their immediate discharge in order to proceed at once to the front! At the same time our successes are tempered with a terrible list of casualties and the wounded and sick are pouring down from all parts of the front, the trains following each other at very short intervals. The numbers in Hospitals No. 1 and No. 2 to-day are roughly:—No. 1: Officers, 73; non-commissioned officers and men, 560. No. 2: Officers, *nil*; non-commissioned officers and men, 580; and Boer prisoners wounded, 32. No. 3 ambulance train arrived yesterday from Kimberley with 31 sick and wounded officers and 83 non-commissioned officers and men. The most serious cases are being left at the hospital in Kimberley on this side and at Pietermaritzburg in Natal. Of course, a great number of these cases are medical, principally dysentery, sunstroke, and enteric fever, it being the object to clear out the hospitals at the front as much as possible. Everything is working very smoothly and the foresight of the Surgeon-General in establishing a sanatorium for sick and wounded officers is relieving the overcrowded state which would necessarily ensue in the base hospitals had there been no means of passing slight cases on. Of course, the present rush of wounded and sick is taxing our resources to a great extent, but luckily there are plenty of transports in the harbour and we are filling them up as far as we can; a great number of nursing sisters and civilian lady nurses have been ordered to Natal on short notice as I hear that there are nearly 3000 sick and wounded who will require nursing immediately Ladysmith is relieved, a matter I suppose of hours now—at least, we hope so. There is, I am happy to say, no lack of material and the civil population are vieing with each other in offers of assistance. Several more officers of the Royal Army Medical Corps and civil surgeons have gone up to Kimberley and the surrounding country, and there is a big base hospital of 500 beds at Naupoort. Sir William Mac Cormac and Mr. Makins are here and the other consulting surgeons are scattered about the front where their services are mostly required. I am sorry to say there have been several deaths from dysentery amongst officers and men, no doubt due to bad water, and the type of disease has been a very severe one, resembling as regards post-mortem appearances the Indian scourge in all its worst forms. Enteric fever as far as I can ascertain has not been so fatal as we were at one time led to suppose, but it has been bad enough in all conscience, and I am afraid that we shall hear some terrible tidings of the ravages of the disease when we get into Ladysmith, which place on all hands is condemned utterly as a military station in the future. As regards the safeguard of inoculation I am not at present in a position to give any very definite opinion, but from the few cases I have seen down here I am satisfied that inoculation has undoubtedly mitigated the symptoms and lessened the mortality, yet I think it full early to give a positive opinion on its merits as a preventive. I am struck much by the marvellous effect of this climate, during the summer months at least, on chest cases. I have seen several undoubted cases of tubercle, or commencing tubercle, of the lungs simply lose every characteristic symptom after a few months' open-air treatment in this climate and to all intents and purposes recover. Whether a return to other climates will light up the old mischief or not remains to be seen, but I am at present keeping my eye on a case in which when I first saw the patient about the middle of December, I considered the gravest prognosis the only one allowable; however, the patient, after battling with a varying temperature of over 100° and frequently running up to 103° at night, with night sweats, emaciation, persistent cough, and every symptom, including bacilli in the sputum, has improved to the extent that he is able to take a fair amount of exercise, feels fit, and is clamouring to be sent to the front. The same remarks apply, as far as climate goes, to patients suffering from nervous exhaustion, dysentery, and sunstroke, who come down perfect wrecks and in a few days, after a residence at Claremont, pick up in a marvellous manner and are fit for duty again. Its curative powers on gunshot wounds I have already described in my earlier letters, and I can now, after a residence here of over four months, endorse every word I then said; in fact, during the spring and summer Cape Town, or rather Wynberg and Claremont, are, as regards climate, simply perfect places for the sick and wounded. We are well off now in the matter of hospitals, as there are several more, including the Yeomanry, to be established in the neighbourhood of Cape Town, so that no misgivings regarding accommodation need be felt.

Wynberg, Feb. 28th.

THE ROYAL COMMISSION ON THE METROPOLITAN WATER-SUPPLY.

(Concluded from p. 798.)

THE Commissioners proceed to consider what amount of flow in the Thames ought to be maintained. Sir Alexander Binnie contended that the flow over Teddington Weir ought never to be reduced to less than 250,000,000 gallons a day and that the river would silt up below Richmond if the flow were materially reduced below that figure. The Thames Conservators passed a resolution in the year 1892 and again in 1896 insisting that after the water companies had taken 130,000,000 gallons daily from the Thames they ought not to be allowed to increase this amount unless the day's discharge at Teddington Weir exceeded 200,000,000 gallons, and then the excess only ought to be taken, so that the discharge over the weir would not fall below 200,000,000 gallons. Sir Frederick Dixon-Hartland, chairman of the Thames Conservancy, objected to the daily flow over Teddington Weir ever being reduced to less than 200,000,000 gallons. The Commissioners are of opinion that the minimum flow over Teddington Weir should be fixed at 200,000,000 gallons and that the companies should not be allowed to deplete the river so as to reduce the flow below that amount "except under special safeguards and restrictions." At the present time the companies have a statutory right to draw 130,000,000 gallons from the Thames without reference to the effect this draught may have on the discharge at Teddington. Of this statutory right they could not be deprived "without their consent or without consideration." Their consent might well be given if they were granted the privilege of drawing their daily quota, not in each 24 hours, but on an average of six months. In that case the companies would not draw water when the river was low and the whole of the water was wanted to keep up the necessary flow over Teddington Weir and "this would be advantageous in the public interest." A material consideration in estimating the cost and possibility that a supply from the Thames could be obtained in sufficient amount to last up to 1941 is the question as to whether the companies should be allowed to draw flood-water into their reservoirs or whether they should be restricted from taking water at the height of the flood. On this question the Commissioners think that discretion may be left to the engineers of the companies and that it may be assumed that as turbid water is a trouble and expense they will when practicable allow a few days of flood to go before they draw the water and therefore a prohibition against the taking of flood-water is unnecessary. To ensure a flow of 200,000,000 gallons a day over Teddington Weir would only be possible by greatly increasing the capacity of the storage reservoirs provided. As to the cost which these reservoirs would entail the Commissioners received conflicting estimates from Sir Alexander Binnie, Mr. Middleton, Mr. Hunter, Mr. Hawksley, and

others. They do not discuss the details of the estimates, but with the assistance of Colonel Rathbone, who was employed as assistant Commissioner, they estimate that the cost of supplying sufficient storage to supply Water London from the Thames with 114,500,000 gallons a day in addition to the 185,500,000 gallons a day (which the companies and the Staines Reservoirs Committee are now authorised to take) in a year as dry as 1893 will be between £9,000,000 and £10,000,000. This estimate, however, does not cover the cost which would be incurred if the existing authorised draught of the companies and of the Staines Reservoirs Committee—namely, 185,500,000 gallons a day—were made subject to the condition that water shall not be taken from the Thames so as to reduce the flow over Teddington Weir below 200,000,000 gallons a day. If this were done by an alteration in the statutory rights of the companies and with their consent the cost of supplying a sufficient storage and pumping power would be £2,500,000 and £2,000,000 further expenditure would be necessary for connexion with the systems of the different companies. The cost of this outlay for making arrangements for the abstraction of more water from the Thames would be gradually incurred and the reservoirs would be made as the need for them arose, so that if the population did not increase at the expected rate the works might be delayed. The works which would be done would become remunerative and productive of income as soon as they were finished. The Commissioners remark that there are other less costly sources of supply, that 27,500,000 gallons a day could be taken from wells in Kent, and Lord Balfour's Commission reported that water might possibly be obtained from chalk wells in the Thames basins above and below the companies' intakes and that wells in the Lee valley might be expected to produce 40,000,000 gallons in dry years and in wet years 55,000,000 gallons or more daily.

The general conclusion to which the Commissioners come is that the estimate that 120,000,000 gallons a day from the Lee and springs and wells of the Lee valley and Kent is not an over-estimate, and that an additional supply from the chalk in Kent and from the Thames valley might be obtained to supplement the supply of 300,000,000 gallons a day from the Thames for the needs of London up to the year 1941. The Commissioners report that much of their time was occupied in considering the scheme for getting a supply from Wales. Estimates differing very greatly in amount were given by witnesses as to the cost of the proposed undertaking, and the divergencies of the estimates were so great "as to make the task of deciding between them difficult and hazardous." The Commissioners think that there is something attractive in the scheme for bringing water from the Welsh mountains for the supply of London and "one would be glad if it were possible now to secure a watershed to be used hereafter if London should require it." The Commissioners report, however, that no chemical or bacteriological tests with regard to the quality of the Welsh water are in evidence, but that it had been stated that the water was free from microbes and contained practically the same organic elements as the London water, and that some of the water was said to be of exceptional purity and softness and might dissolve a considerable portion of lead and this Professor Dewar warned them would probably necessitate proper treatment before it could safely be used. The Commissioners received no statistics with regard to the effects of the drought in the years 1893 and 1898 and the amount of average rainfall was estimated in the driest years to be 80 of the average rainfall. Should the present supplies prove sufficient in quantity and of satisfactory quality it seems unnecessary that the cost should be incurred of bringing water from a distance to London.

The cost of constructing works near the Thames is not the only expense which will have to be borne by the companies or by a purchaser between the present time and the year 1941. Much will have to be expended in making storage works in the Lee valley, for the machinery necessary to utilise further supplies from the chalk, and in laying mains for the distribution of water. The Commissioners estimate that the total capital expenditure up to the year 1941, should the Thames and other local supplies be used, will amount in round figures to £18,100,000. This expenditure will have to be made whether additional supplies are obtained from the Thames or from Wales, or from other sources, but as it will be incurred for supplying new customers it will bring an immediate increase to the income derived from the water rates.

The estimate given by the Commissioners exceeds that given by the companies. In pointing out this fact the Commissioners say that they addressed a circular to the directors asking them for an estimate of what they expected their capital expenses would amount to during the next 40 years. The estimates amounted altogether to a sum of £13,720,150, but the directors and their engineers expressed their sense of the difficulty they had in giving definite figures, and this difficulty they thought so great that they felt it impossible to ensure anything like accuracy. The Commissioners in summing up their own figures estimate that the capital expenditure required up to 1941 will be £4,800,000 to bring a daily supply of 185,500,000 gallons, which is the present authorised draught from the Thames, if the conditions of storage and river flow which they recommend are provided for. To provide adequate storage for an additional supply of 114,500,000 gallons from the Thames the cost will be £9,000,000 or £10,000,000; for works of distribution £18,100,000; for storage works on the Lee a further amount (not specified) must be added to the total of £32,000,000 to £33,000,000. Should further supplies be obtained from Wales the outlay would be much increased. The magnitude of the future requirements of London in regard to water-supply lead the Commissioners to the conclusion that the concentration of the water undertakings into the hands of one authority is desirable. It will be necessary to make large works should the supply be taken from the Thames and the Lee without injury to the rivers. There will be practical difficulties in carrying out these works if the undertakings are not owned by a single authority. The amalgamation of the existing companies according to one witness would be extremely difficult, according to another impracticable. A public authority would be able to raise the necessary sum for carrying out new works at a cheaper rate than the companies could obtain it if the authority had power to borrow on the security of the general rates, and in that case money might be raised at from ¼ to ½ per cent. less than the companies would have to pay. The whole expenditure mentioned will not have to be made immediately, but it is likely to be less remunerative than similar expenditure made by the companies has hitherto been and the new supplies required will be more expensive. The companies have been working on a tide of prosperity and, as a rule, their profits have steadily increased. The Commissioners ask themselves what would happen if there were a necessity for large expenditure which would probably be unremunerative for some time with the consequence of reduced profits to the companies, and they answer their question by saying that the directors, having before them the double duty of safeguarding the interests of the shareholders and of the consumers, would be placed in a difficult position which might lead to results unsatisfactory to the consumers, whereas a public authority having acquired the undertakings would be likely to have no other object in view than to satisfy the requirements of the consumers. Having regard, therefore, to the future requirements of Water London it is desirable that the undertakings should be acquired and managed by a public authority. If after purchase by a public authority a sinking fund were dispensed with and the present water charges were maintained the purchaser might be able to pay his way and the increase of the water revenue might make it possible to reduce the charges for water sooner than such a reduction would be made under the management of the companies, because in the latter case the maximum dividends would have to be reached and the payment of back dividends must take place first. The reduction would also extend to the New River district, on which no reduction is obligatory so long as this company exists with its present statutory rights.[1]

The Commissioners having come to the conclusion that the water companies' undertakings should be bought by a public authority proceed to consider by what authority the purchase should, in their opinion, be effected. They give a summary of the sources of the water supplied by the companies and then refer to the evidence of Sir Alexander Binnie with regard to division of the sources of supply between the metropolitan counties and London, pointing out that schemes of severance would result in the London County Council being made the water authority for part of the county and not for the rest and would lead to complications with the independent suburban water companies and local authorities which supply water and which

[1] At the present time the New River Company does not charge the full rates which are authorised.

exist to the number of 18 in Greater London or the parts of Water London outside Greater London. Sir Alexander Binnie thought that the metropolitan councils would find themselves driven to take water in bulk from the London County Council. The difficulties attending this course have been already stated, and the representatives of the metropolitan counties, moreover, insist on being severed from London both with regard to the supply and to the distribution of water in case of the purchase of the present undertakings by the London County Council. The difficulties which have been pointed out having led the Commissioners to advise that the London County Council should not be the purchaser, they proceed to report as to what authority if the policy of purchase be adopted should acquire the undertakings. It is not desirable that several authorities should become the purchaser. Any advantage which might obtain from the purchase, whether financial or administrative, will arise only from amalgamation of the sources of supply and distribution so that they may be used economically and with a view to the needs of every part of Water London. The feeling against purchase by a Water Board formed on the basis of population and rateable value is emphasised by the metropolitan counties on several grounds, and the practical difficulty of creating any water trust based on strictly representative principles was shown by the history of a Government Water Bill introduced in the year 1896, which, owing to the opposition of the metropolitan counties, was so modified in Parliament that a clause enabling any county to take itself out of the water trust was inserted and the Bill was dropped. The Commissioners appreciate the great difficulty in advising as to the constitution of a Water Board which will be accepted by the various interests concerned and by Parliament, but considering the importance and intricacy of questions relating to future water-supply, the large amount of works which will have to be undertaken, the difficulty of obtaining from eight separate companies that unity of action which is necessary for bringing such works to a successful issue, the importance of bringing about absolute coalescence of the water companies' undertakings,—all these things lead to the conclusion that the purchase and management by a single public authority will solve the question satisfactorily. The suggestions which are made with regard to the constitution of a water authority which should undertake these vast duties are as follows: the Water Board should be a permanent body consisting of not more than 30 members; its proceedings should be brought under the observation of Parliament automatically and periodically; and it should include delegates from the Local Government Board, The suggested composition is: that the London County Council should appoint 10 members, the Conservators of the Thames four members, the County Councils of Middlesex, Surrey, Essex, Hertford, and Kent, the Lee Conservancy Board, and the Common Council of the Borough of West Ham two members each. The chairman and vice-chairman should be appointed by the Local Government Board. The appointing authorities should be empowered to fill any vacancy caused by the death or the resignation of a representative. The offices should be held for a definite (unspecified) number of years. The chairman and vice-chairman should receive adequate salaries. The other members of the board should be paid according to their attendances (as is now done in the case of the Conservators of the river Thames). The board should be required to acquire the undertakings of the metropolitan water companies by agreement or by arbitration. The boroughs of Croydon and Richmond are reasonably entitled, if they wish it, to be made independent of the board. The board should be entitled to issue 3 per cent. stock secured on the water charges of the whole area; this should be made a trustee investment transferable at the Bank of England. The Chamberlain of the City of London should transfer all the money which has accumulated as the result of the sinking fund clauses, and these clauses should be repealed at and from the date of purchase of the undertakings. The price of purchase should be payable in cash at the option of either the vendors or the purchasers. The vendors may be paid in the stock of the board should the shareholders agree to that course. Should a sinking fund be required the probability of a deficit will arise and this will make it necessary to empower the Board to increase the water charges which the companies are entitled to demand if the interest on the stock cannot be otherwise paid. In any case the Commissioners think such a precaution would be a prudent one. It would not be unreasonable to empower the board in case of deficit to levy a rate in aid. A rate in aid supplements the insufficiency of charges and is unjust to those ratepayers who have provided themselves with a water-supply and take nothing from the companies as in the case of breweries and other industrial establishments: but there are public purposes, such as extinguishing fires, street-watering, the supplies for public baths, &c., which benefit all ratepayers whether they take water or not, and in consideration of them all ratepayers may be called upon to make some contribution for the services rendered. Possibly the Water Board would have occasion to look to the rates for further assistance. It is this possibility which arouses the fears and excites the opposition of counties such as Middlesex and Kent. The Commissioners make a suggestion by which this opposition "may be quieted." Assuming, they say, that the Water Board has to borrow £10,000,000 at an annual charge, say of £300,000, for interest, if that charge were distributed among the six counties concerned in the proportion of the number of supplies they are respectively taking, the contribution asked from time to time will be roughly proportioned to their own needs and not to the needs of other counties. The Commissioners suggest that the contribution should be demanded by precept issued by the Water Board to the county authorities when the money would be raised by the local authorities either by an equal rate or by rates levied in the parishes affected in the proportion of the number of water supplies given.

As to whether it would be better to enable the proposed Water Board to meet deficiencies of revenue by recourse to the rates or by making an increase in the water charges is "a question of policy" which the Commissioners decide it is not for them to determine, and they content themselves by emphasising the possibility or probability that such deficiencies will arise should the proposed Water Board come into being on the lines suggested, and by pointing out alternative means of raising the money which is likely to be or may be wanted. The Water Board should be required to draw up an annual report of the statement of accounts. This should be audited by an independent auditor. The report and the account should be included in the annual report of the Local Government Board.

LEAD POISONING IN THE POTTERY DISTRICTS.

AT a meeting summoned by the Duchess of Sutherland at Trentham on Wednesday, March 14th, a conference of the medical men of the neighbourhood took place to consider the most thorough treatment of the cases of lead poisoning which occur in the Pottery districts. Dr. H. Lewis Jones of the Electrical Department of St. Bartholomew's Hospital, London, had been invited to speak on the electrical treatment of these cases from his experience of those patients sent from the Potteries to be under his care. The chair was taken by Dr. A. M. MCALDOWIE and the meeting was well attended, over 40 persons being present. In speaking of electricity in the treatment of paralysis due to lead poisoning Dr. LEWIS JONES said that cases of lead poisoning were not particularly common in London, about a dozen cases a year applying for treatment at the electrical department of St. Bartholomew's Hospital, and the type of case seemed to differ from that sent from the Pottery districts in that the patients were older and had the disease in a more chronic form. The interesting points about the cases from the Potteries were the comparative youth of the patients and the severity of their paralytic symptoms, which though more serious were more amenable to treatment by reason of the fact that the intoxication by the lead had gone on for a shorter time. With regard to the mode of treatment, ten years ago it was by the direct application of the constant current to the paralysed muscles by means of hand electrodes; from that it had been changed to treatment by means of electrical arm-baths; the current employed had also been changed from the constant current to the induction coil with arm-bath and later to the current from the mains. With the present mode of application patients seemed to improve rather more rapidly. It was difficult in all matters concerning efficacy

of treatment to bring forward absolute and conclusive evidence that recovery was due to the treatment applied, but this could be said, that on the commencement of electrical treatment improvement began for the most part immediately and the progress of improvement coincided very closely with the progress of the treatment. Wrist-drop from lead was a serious condition and was slow to yield to any treatment. It was often necessary to persevere with it for from three to six months or even longer before the full benefit could be secured by the electricity. Because of this there was a tendency to regard electrical treatment as of little or no use and to think that any improvement which might take place was due to lapse of time or to natural causes. In trying to estimate the value of electrical treatment there was the difficulty of understanding exactly how the electricity worked. The question of the elimination of metals in various kinds of metallic poisoning was an old one. Electric baths had been recommended for the extraction of lead, mercury, and other metals from patients' bodies, but these metals tended to natural and spontaneous elimination in the ordinary course of events; the rate of elimination could be promoted or retarded by drugs, but the treatment of the paralysis and the elimination of the metal were independent of each other in so far as the one could be measured by the other and it was very difficult to prove that lead could be extracted from a patient's body by processes of electrolysis. Alternating currents were almost invariably used in the treatment of lead poisoning at St. Bartholomew's Hospital, therefore it was clear that electrolysis played no part in the recovery of such cases because electrolysis was a property of the direct current. The electricity acted as a stimulant to the nerves and muscles involved and to the blood-supply circulated through them, and by stimulating these parts the natural process of elimination was also stimulated. The routine method of treating wrist-drop caused by lead was as follows: an arm-bath of stoneware was filled with warm water and the forearms and hands of a patient were immersed in it and a current was passed from one end of the bath to the other through the water and the limb between two electrodes placed at the ends of the bath. The alternating current was used in preference and the 100 volts from the electric light mains were reduced by a transformer to 12, 14, or 16 volts to suit the cases. It was, perhaps, unusual to find an alternating current advocated for treating muscles which showed the reaction of degeneration and which were unable to respond by contraction to rapidly alternating currents. But this was part of a large question. Experience had shown over and over again that alternating currents had a valuable influence upon muscles which did not contract to them. For the treatment of the paralytic form of lead-poisoning electricity was undoubtedly the best, and for conditions other than paralysis, particularly the anæmia and debility which were often met with, electricity again rendered important service in assisting the natural elimination of the poison and promoting the general activity of the tissues. To render electricity a practical method it was necessary to make it easy of application. The arm-bath with an induction coil represented the simplest electrical application possible and reduced the labour of treating a patient to a minimum.—Dr. R. ALCOCK, Mr. W. ARMSTRONG, Dr. W. C. D. PRENDERGAST, and Mr. F. F. ARMYTAGE also spoke, and the last-named gentleman showed three cases.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

IN 33 of the largest English towns 6659 births and 4525 deaths were registered during the week ending March 17th. The annual rate of mortality in these towns, which had declined from 25·8 to 20·4 per 1000 in the four preceding weeks, further decreased to 20·3 last week. In London the rate was 18·8 per 1000, while it averaged 21·3 in the 32 provincial towns. The lowest death-rates in these towns were 12·7 in Croydon, 14·9 in West Ham, 16·4 in Brighton, and 16·5 in Bristol; the highest rates were 25·7 Salford, 27·6 in Liverpool, 28·6 in Oldham, and 31·1 in Preston. The 4525 deaths in these towns included 423 which were referred to the principal zymotic diseases, against 416 and 424 in the two preceding weeks; of these, 141 resulted from measles, 124 from whooping-cough, 77 from diphtheria, 32 from "fever" (principally enteric), 28 from diarrhœa, 20 from scarlet fever, and one from small-pox. No fatal case of any of these diseases occurred last week either in Swansea, Birkenhead, or Huddersfield; in the other towns they caused the lowest death-rates in Croydon, Nottingham, and Sunderland, and the highest rates in Plymouth, Wolverhampton, Salford, and Preston. The greatest proportional mortality from measles occurred in Plymouth, Cardiff, Wolverhampton, Salford, Preston, and Halifax; and from whooping-cough in West Ham, Wolverhampton, Birmingham, Liverpool, Leeds, and Newcastle. The mortality from scarlet fever and from "fever" showed no marked excess in any of the 33 towns. The 77 deaths from diphtheria included 35 in London, eight in Sheffield, seven in Leicester, five in Leeds, and four in Bristol. One fatal case of small-pox was registered last week in Cardiff, but not one in any other of the 33 large towns. There were five cases of small-pox under treatment in the Metropolitan Asylums Hospitals on Saturday, March 17th, against seven at the end of the two preceding weeks; two new cases were admitted during the week, against three, two, and one in the three preceding weeks. The number of scarlet fever patients in these hospitals and in the London Fever Hospital at the end of the week was 1760, against numbers decreasing from 3578 to 1777 on the 17 preceding Saturdays; 181 new cases were admitted during the week, against 160, 154, and 147 in the three preceding weeks. Influenza was certified as the primary cause of 26 deaths in London. The deaths referred to diseases of the respiratory organs in London, which had declined from 527 to 378 in the four preceding weeks, rose again to 391 last week, but were 130 below the average. The causes of 64, or 1·4 per cent., of the deaths in the 33 towns were not certified either by a registered medical practitioner or by a coroner. All the causes of death were duly certified in West Ham, Nottingham, Leeds, and in 10 other smaller towns; the largest proportions of uncertified deaths were registered in Birmingham, Liverpool, Preston, Hull, and Newcastle.

HEALTH OF SCOTCH TOWNS.

The annual rate of mortality in the eight Scotch towns, which had been 31·7, 29·0, and 27·7 per 1000 in the three preceding weeks, further declined to 22·7 during the week ending March 17th, but exceeded by 2·4 per 1000 the mean rate during the same period in the 33 large English towns. The rates in the eight Scotch towns ranged from 15·9 in Leith and 18·6 in Dundee to 26·6 in Greenock and 27·0 in Perth. The 700 deaths in these towns included 18 which were referred to diarrhœa, 17 to measles, 15 to whooping-cough, five to scarlet fever, four to diphtheria, and four to "fever." In all 63 deaths resulted from these principal zymotic diseases, against 69, 74, and 92 in the three preceding weeks. These 63 deaths were equal to an annual rate of 2·0 per 1000, which was slightly above the mean rate last week from the same diseases in the 33 large English towns. The fatal cases of diarrhœa, which had been 18 and 25 in the two preceding weeks, declined again to 18 last week, and included five in Edinburgh, five in Aberdeen, three in Glasgow, and three in Dundee. The deaths from measles, which had been 20 and 17 in the two preceding weeks, were again 17 last week, of which seven occurred in Glasgow, five in Dundee, and four in Paisley. The fatal cases of whooping-cough, which had been 15 and 24 in the two preceding weeks, declined again to 15 last week, and included five in Glasgow, five in Edinburgh, and two in Perth. The deaths from scarlet fever, which had been 10 in each of the two preceding weeks, declined last week to five, of which three were registered in Glasgow. The four fatal cases of diphtheria showed a decline of three from the number in the preceding week and included two in Glasgow. The deaths referred to different forms of "fever," which had been six and nine in the two preceding weeks, declined again last week to four, of which three occurred in Glasgow. The deaths referred to diseases of the respiratory organs in these towns, which had been 362, 324, and 259 in the three preceding weeks, further declined to 189 last week, but showed an excess of 51 over the number in the corresponding period of last year. The causes of 27, or nearly 4 per cent., of the deaths in these eight towns last week were not certified.

HEALTH OF DUBLIN.

The death-rate in Dublin, which had been 34·3 and

36·8 per 1000 in the two preceding weeks, declined again to 31·2 during the week ending March 17th. During the past four weeks the death-rate in the city has averaged 38·3 per 1000, the rate during the same period being 19·5 in London and 22·6 in Edinburgh. The 209 deaths registered in Dublin during the week under notice showed a decline of 38 from the number in the preceding week, and included nine which were referred to the principal zymotic diseases, against 12 and 10 in the two preceding weeks; of these four resulted from measles, four from diarrhœa, one from whooping-cough, and not one either from small-pox, from scarlet fever, from diphtheria, or from "fever." These nine deaths were equal to an annual rate of 1·3 per 1000, the zymotic death-rate during the same period being 1·7 in London and 2·2 in Edinburgh. The fatal cases of measles, which had been five, one, and two in the three preceding weeks, further rose last week to four. The deaths from diarrhœa, which had been five and three in the two preceding weeks, rose again to four last week. The 209 deaths registered in Dublin last week included 34 of infants under one year of age and 58 of persons aged upwards of 60 years; the deaths both of infants and of elderly persons showed a slight decline from the numbers recorded in the preceding week. Seven inquest cases and four deaths from violence were registered, and 78, or more than a third, of the deaths occurred in public institutions. The causes of 17, or more than 8 per cent., of the deaths in the city last week were not certified.

THE SERVICES.

ROYAL NAVY MEDICAL SERVICE.

THE following appointments are notified:—Surgeons: A. H. Prichard to the *Research*; J. N. Robertson to the *Triton*; A. W. B. Livesay and J. P. Willis to the *Pembroke*, for Chatham Dockyard; H. R. Gardner to the *Thunderer*; and R. J. Mackeown to the *Excellent*.

THE IMPERIAL YEOMANRY.

Thomas Walcot to be Medical Officer, with the temporary rank of Captain.

ROYAL ARMY MEDICAL CORPS.

Surgeon-Captain A. Macdonald, A.M.R., assumes medical charge of troops, Station Hospital, &c, Edinburgh Castle. Lieutenant-Colonel R. Drury assumes medical charge of the Female Hospital, staff, and departments, Curragh Camp. Brigade-Surgeon-Lieutenant-Colonel F. Howard, A.M.S., (retired) and Captain W. H. P. Lewis join the Home District for duty.

Surgeon-Major E. J. Lawless, 4th Volunteer Battalion the East Surrey Regiment, is granted the temporary rank of Major whilst serving in South Africa. Surgeon-Lieutenant John K. Tomory, 1st Sutherland Volunteer Corps, is granted the temporary rank of Lieutenant whilst serving in South Africa. Captain C. F. Wanhill, from the Seconded List, to be Captain, vice R. H. E. G. Holt, who died from wounds received in action. Surgeon-Major E. L. Freer, 1st Volunteer Battalion the Royal Warwickshire Regiment, is granted the temporary rank of Major whilst serving in South Africa. The undermentioned officers are granted the temporary rank of Lieutenant while serving in South Africa:—Surgeon-Lieutenant A. H. McDougall, 1st Volunteer Battalion the Royal Warwickshire Regiment; Surgeon-Lieutenant John Clay, 2nd Volunteer Battalion the Northumberland Fusiliers.

VOLUNTEER CORPS.

6th Lancashire: Surgeon-Major J. B. Oliver resigns his commission, with permission to retain his rank and to wear the uniform of the corps on his retirement. 2nd Middlesex: Ernest Alfred Snape to be Surgeon-Lieutenant. 1st Volunteer Battalion the Cheshire Regiment: Surgeon-Lieutenant C. T. Green to be Surgeon-Captain. 2nd Volunteer Battalion the East Surrey Regiment: James Dunbar-Brunton to be Surgeon-Lieutenant. 4th Volunteer Battalion the East Surrey Regiment: The undermentioned gentlemen to be Surgeon-Lieutenants: Thomas Mahon Morton and Williams Henry Frome Young. 2nd Volunteer Battalion the Hampshire Regiment: Surgeon-Major R. T. Cæsar to be Surgeon-Lieutenant-Colonel. 5th (Perthshire Highland) Volunteer Battalion the Black Watch (Royal Highlanders): John Anderson to be Surgeon-Lieutenant. 4th (Stirlingshire) Volunteer Battalion Princess Louise's (Argyll and Sutherland Highlanders): Surgeon-Captain A. D. Fraser to be Surgeon-Major.

Memorandum.—Rifle: The undermentioned officers are borne as supernumerary whilst serving with the Royal Army Medical Corps in South Africa:—4th (Cambridge University) Volunteer Battalion the Suffolk Regiment: Surgeon-Lieutenant R. W. Michell. 1st Volunteer Battalion the Duke of Wellington's (West Riding Regiment): Surgeon-Captain G. G. Oakley. 6th (Fifeshire) Volunteer Battalion the Black Watch (Royal Highlanders): Surgeon-Captain C. E. Douglas. 9th Lanarkshire: Surgeon-Lieutenant J. C. Taylor.

"TACTICS FOR SANITARY TROOPS ON THE FIELD OF BATTLE."

Under the above heading Captain Lœffler, who is a staff officer in the German army, has written a short but comprehensive manual[1] for the information and guidance of all concerned in active military operations, whether they belong to the combatant or to the departmental branches of the service. Adopting as his foundation a small force consisting of two army corps, a reserve division, and a division of independent cavalry the author formulates a series of typical military situations, inclusive of outpost affairs, skirmishes, ambulant engagements, and pitched battles, indicating with great precision the duties of medical officers, both administrative and executive, and showing how the slightly wounded should be disposed of as well as by what means the more seriously injured are to be transferred to the rear preparatory to their removal to stationary hospitals. Captain Lœffler's little work, which does not trench at all upon purely medical matters, is well conceived and concisely executed. For the first time in official or semi-official military literature the officers and men of the medical department are treated as soldiers. It is true that from the point of view of a commander, whose *summum bonum* must necessarily be the destruction of his opponents, the relative importance of life-savers can be only small; but in this humane age public opinion insists upon prompt medical aid being forthcoming on the field of battle, and the more the work of the men who have to afford it is facilitated by their assimilation to the men in the fighting rank the better it will be for the solidarity of the entire army. The men, equally with the officers of the Royal Army Medical Corps, are debarred from the satisfaction of striking a blow aggressively, while for lack of sufficient training their efforts in self-defence cannot be supposed to be other than crude and impotent; and yet they are expected to share in all the battle risks of the combatants, besides braving others of a different nature, but just as dangerous to life, if not more so, after the excitement is all over and done with. Throughout Captain Lœffler's book the military status of medical officers is fully recognised. In its pages the reader can see the principal medical officer by the side of his General prior to an engagement, receiving the chief's instructions in company with the other subordinate commanders, and explaining for their benefit how he proposes to make his section fit into the general plan. As the recognised head of an essential portion of the force he is accorded, in so far as his own department is concerned, the attributes of an adjutant-general, being empowered to issue his commands. "By order of the general officer commanding the troops." The issue of this manual marks a distinct step in advance, indicating, as it does, the unequivocal position to which German military medical officers have attained. A volume similar in scope and to a certain extent in treatment has been prepared at the headquarters of the French army and will shortly be published. We sincerely trust that it will not be long before the example thus worthily set is followed by our own military authorities.

TRANSVAAL WAR NOTES.

The Imperial Yeomanry Base Hospital, which has been erected at Deelfontein, about 30 miles to the south-west of De Aar, was opened on March 17th.

A bed for the Imperial Yeomanry Hospital has been endowed by Jewish boys and girls of Cape Town, and the endowment of another bed is promised by the Israel Lodge.

The *Winifredian* arrived at Southampton on Monday, March 19th. She brought 170 men from South Africa for the Royal Victoria Hospital, Netley.

The Hospital Ship *Princess of Wales* has left on her second journey to South Africa.

[1] Published by Mittler und Sohn, Berlin, 1899, pp. 86.

The Welsh Hospital is expected to leave England in about ten days, Professor Thomas Jones, M.B. Lond., F.R.C.S. Eng., Mr. J. Lynn Thomas, F.R.C.S. Eng., and Mr. R. Mills-Roberts, F.R.C.S. Edin., will act as surgeons, and Mr. Laming Evans, M.B. Cantab., F.R.C.S., late house surgeon, St. Bartholomew's Hospital, and Mr. Herbert Davies, M.B., Ch.B. Vict., senior house surgeon, Stoke-on-Trent Infirmary, as assistant surgeons. Five dressers and nine or ten nurses will complete the staff. The hospital funds now amount to over £6000 and among the subscribers during the past week have been H.M. the Queen £100, H.R.H. the Prince of Wales £50, and H.R.H. the Duke of York £20.

THE LATE SIR WILLIAM LOCKHART.

In the death of the Commander-in-Chief of Her Majesty's forces in India the country and the army have sustained a great loss, and we cannot refrain from paying a sincere tribute of respect on the part of the British and Indian medical services to his memory. The late Sir William Lockhart had a very distinguished career and was a very brave man of quite exceptional qualities. He came of a good stock; his uncle was John Gibson Lockhart, the son-in-law and biographer of Sir Walter Scott, and Sir William Lockhart was himself, apart from his high military reputation, a man of ability and culture and possessed an excellent knowledge of German. He was very wise in counsel, decided and prompt in action, and eminently honest and considerate in his dealings with all—and not least so in the case of officers of the medical services. Notwithstanding that he was known to have been for a long time in delicate health his death was a surprise and a real grief to all who had the privilege of his acquaintance. He looked as he was, every inch a soldier—a handsome man of fine physique, to whom independence, courage, and self-sacrifice were natural and instinctive.

A ROYAL NAVAL MEDICAL RESERVE.

Our contemporary the *Army and Navy Gazette* contains a communication signed Louis Vintras, M.D., B.Sc., medical officer R.M.S. *Orinoco*, regarding the value of having competent reserves in all branches of the services. Dr. Vintras suggests, *apropos* of the call that has been made on the civil profession to supplement the Army Medical Service during the campaign in South Africa, that a Royal Naval Medical Reserve might be organised with very little expense to the State out of the number of medical men who have passed several years of their career in the service of one or another of the mail lines, who are used to the sea, have a knowledge of the medical aspects and hygiene of medical life, who are experienced in tropical diseases, and thoroughly inured to rapid changes of climate. The idea seems a good one and fits in with that of the Naval Medical Reserve composed of officers of the large mail companies. Dr. Vintras asks for communications from persons in sympathy with such a movement, or who have suggestions to offer concerning it, to be addressed to him at 19A, Hanover-square, W.

MENTIONED IN DESPATCHES.

In a despatch from Lord Methuen on the action at Magersfontein on Dec. 10th and 11th, sent by Lord Roberts to the Secretary of State for War, occur the following passages:—

"Major O'Donnell, Royal Army Medical Corps, and Lieutenant Delap, Royal Army Medical Corps, were indefatigable in attending wounded under fire." Black Watch.—Lieutenant Douglas, Royal Army Medical Corps, showed great gallantry and devotion, under a very severe fire, in advancing in the open and attending to Captain Gordon (Gordon Highlanders), who was wounded; also a ttending to Major Robinson and other wounded men under a fearful fire."

SIR GEORGE WHITE.

It will be remembered that the gallant defender of Ladysmith in a brief public speech of thanks for the congratulations tendered to him after the relief of that garrison incidentally adverted to the fact that he was at the time suffering from fever with a temperature of 102°F. Everybody will have learned with regret that Sir George White did not recover his health so rapidly as could be desired and that he has wisely embarked and is returning to this country where all, without exception, wish for his speedy recovery. Sir George White, it is needless to add, went through a most trying time during the long siege, and, in addition to the hardships and privations he underwent, he had all the care and great responsibility of the position. The part he played was worthy of him, and the siege will hereafter occupy a prominent place in military history.

FRUIT FOR THE MILITARY HOSPITALS.

Lady Haliburton in a letter to the *Times* says: "..... I have undertaken to send weekly to Netley Hospital a small supply of fresh fruit for the use of the invalids returning from South Africa. Many others, if aware that they might enjoy this privilege, would no doubt gladly avail themselves of such an opportunity of usefulness by sending regular supplies of fruit to the various large military hospitals scattered throughout the United Kingdom. ....." It is to be hoped that many others will follow Lady Haliburton's example.

The total number of conscripts for the French army last year, says the *Army and Navy Gazette*, shows a reduction of nearly 15,000 on that of the previous year. This noticeable drop has caused some uneasiness. The fundamental cause of the diminution is doubtless due to the stationary state of the population, but it is also a fact that there has been a special cause at work. The medical examination of the conscripts has been far more severe than for several years past.

Major W. Dick, M.B., F.R.C.S. Edin., R.A.M.C. (who is acting for Colonel W. F. Stevenson, M.B. Dub., R.A.M.C., as Professor of Military Surgery in the Army Medical School, Netley), having been relieved of the charge of the Surgical Division of the Royal Victoria Hospital, Major Birt, R.A.M.C., has been appointed to the office.

The following gentlemen have been ordered to join the Army Medical School as surgeons on probation for the Royal Army Medical Corps:—Mr. H. E. Weston, L.S.A., St. George's Hospital; Mr. J. G. Churton, M.R.C.S. Eng., L.R.C.P. Lond.; Mr. A. E. Hamerton, M.R.C.S. Eng., L.R.C.P. Lond., Leeds School of Medicine.

Royal Army Medical Corps messes have now been established in India to which the Government grant 80 and 100 rupees per mensem respectively where eight or ten officers form the mess.

The following civil surgeons having arrived at Netley are posted as stated: Mr. Marriott to the huts for duty, and Dr. A. C. Profeit to the surgical division.

Correspondence.

"Audi alteram partem."

"CROOK v. CROOK AND HORROCKS."

To the Editors of THE LANCET.

SIRS,—Will you permit me through your columns to thank all those who have written to me letters of sympathy and congratulation and also to thank Dr. William Duncan and many others who have expressed a desire to help to defray my costs. I quite appreciate the kind motive and am very grateful, but I prefer that no subscription list should be started on my behalf.

I am, Sirs, yours faithfully,

Brook-street, W., March 19th, 1900. PETER HORROCKS.

"THE NITRO-PROPIOL TEST FOR SUGAR IN URINE."

To the Editors of THE LANCET.

SIRS,—In THE LANCET of Feb. 17th there was a notice of Teusch's Nitro-Propiol Test for sugar which induced me to send for a bottle of the tablets in order to compare it with the ordinary method by Fehling's solution. According to the directions supplied with the tablets we are told to dissolve one tablet in about three drachms of water, add 10 drops of the suspected urine, and boil slowly for from three to five minutes. A fine colouration of indigo blue is said to take place if sugar be present, the indigo being deposited when the fluid is allowed to stand. It is at once obvious that boiling for from three to five minutes is a disadvantage for two reasons: it takes up a good deal of time and it is impossible to boil continuously for so long in a test tube without explosions of steam, so that the process must be carried out in a flask or capsule. But this is not a serious

objection if the method were so accurate as not to need confirmation.

It is well known that the power of reducing cupric oxide is not peculiar to grape sugar but is shared by a good many other substances which are frequently present in sufficient quantities in the urine to cause at any rate a partial reduction of the test solution, so that a method which would be equally delicate and positive in its results and which would stand in no need of confirmation by other means would be a boon to clinical medicine. From this point of view I cannot speak very highly in favour of the new test. A case of diabetes under my care which has improved so much that the sugar in the urine for a long time has been less than 1 per cent., and estimated by Fehling's solution gives 0·8 per cent., failed to give any reaction at all with Teusch's test. On the other hand, the urine I have been examining this morning, which deposits an abundant sediment of cayenne-pepper-like crystals of uric acid, reduced Fehling's solution partially so as to give a dirty yellow precipitate. After filtering through animal charcoal, according to the method advocated by Sir William Roberts for removing reducing substances other than sugar from the urine, the test solution remained perfectly clear, bright, and unaltered in colour. I should say, therefore, that this urine does not contain sugar, but that the reduction is due to uric acid; however, after boiling in a capsule with Teusch's test a blue film of indigo was deposited upon the capsule.

In order to clear up this point I had this urine examined by fermentation and with phenyl hydrazin, both of which gave a negative result. In this case, then, Teusch's test is out of harmony with the results of three methods which are generally regarded as trustworthy. Therefore it does not seem to possess any advantage, either in rapidity of application, delicacy, or accuracy, over Fehling's solution.

I am, Sirs, yours faithfully,

March 19th, 1900. ROBERT SAUNDBY.

THE MIDWIVES BILL.

To the Editors of THE LANCET.

SIRS,—Perhaps it may help if I call attention to the fact that the present Midwives Bill is based upon two principles—one that of control and one that of improving the status of the midwife. For practical purposes these two principles are incompatible, for with improvement in status control of any value is impossible. It is therefore idle to talk of amendments until it is decided upon which principle legislation is to be based. I cannot help congratulating the gentlemen of the Obstetrical Society of London upon their success. They have succeeded in making it to appear before the world that their society is in favour of legislation, and, besides their society, both corporations. They have also hauled into the meshes of their net the council of the British Medical Association. As you point out in your issue of March 17th they are really backed by a very small number of the profession, as I ascertained some years ago. These congratulations I cannot accord to the profession as a whole, which has allowed, by its failure to provide an organisation capable of defence, a few persons to give away the mass. Perhaps the sense of danger, which many will not appreciate until it is too late, will hasten the organisation of the profession. At the present moment a study of the history of the Bill will show conclusively that the profession is powerless in the face of an organised body, however small and unimportant. The policy of the corporations is to keep down the general mass of the profession, and a very wise policy, too, from their point of view. It will require a powerful organisation to cope with them.

I am, Sirs, yours faithfully,

Hatfield, March 19th, 1900. LOVELL DRAGE.

THE MERITS OF BLACK INSTRUMENTS IN THE EXAMINATION OF INTERIORS.

To the Editors of THE LANCET.

SIRS,—Custom is commonly in error in the construction of specula employed for the illumination of various cavities in that it is generally assumed that they must be made of bright reflecting surfaces. The word speculum itself suggests this so far as it signifies a mirror. Practically many must have observed that the bright specula designed with the object of carrying light further into the cavity illuminated, so far from effecting this object, actually prove disconcerting to the vision by surrounding the dark region investigated with a field of dazzling light. Even supposing that more light is actually carried inwards, which is often doubtful, it must be largely counter-balanced by the reflection backward on to the operator's eye. And when it is remembered that the first physical essential for examining a field darker than its environment is that the pupil should dilate it is obviously unscientific to counteract this by the inevitable contraction which the reflected light from the speculum induces. This has been realised to a certain extent by the construction of black vulcanite aural and other specula, which are of course useful by assisting dilatation of the pupil. And any surgeon using the black nasal specula I have had constructed for me by Messrs. Mayer and Meltzer will realise the immense gain when contrasted with the ordinary silvered instruments. Extending this principle in the use of intra-laryngeal instruments I have had forceps similarly blackened. The result is of considerable gain when removing minute papillomata from the vocal cords, in which case any condition which prevents contraction of the pupil while examining the relatively dark interior of the larynx must be of essential value. And I believe the gain to the operator is as great here as in examining the nose with blackened specula. Presumably there is no reason why nasal forceps, &c., should not be similarly blackened, though the need is obviously not so great as in operations upon the larynx. Messrs. Mayer and Meltzer have spent much time in discovering a satisfactory method of blackening and, in spite of disappointments, have, I think, succeeded admirably.

I am, Sirs, yours faithfully,

March 19th, 1900. GREVILLE MACDONALD, M.D. Lond.

"THE CORONERS' SOCIETY OF ENGLAND AND WALES."

To the Editors of THE LANCET.

SIRS,—Mr. Braxton Hicks's letter of March 12th, published in THE LANCET of March 17th, informs the general body of the medical profession of an opinion expressed by the above-named society on the questionable duty of the medical practitioner in attendance being bound to report to the coroner for his district all deaths other than those arising from natural causes. While convinced that Mr. Braxton Hicks correctly states the opinion of this society, to which he acts as honorary secretary, may I be permitted to point out that the profession at large are not obliged to abide by any opinion or resolution expressed by this or any other kindred society, but by the ruling of the courts of justice on this point? Till such definite ruling is obtained they can afford to ignore all such resolutions.

Whilst candidly admitting "*that no particular class of persons is mentioned whose duty it should be to inform the coroner*" (the italics are mine), he proceeds to postulate that the hypothetical conjectures put forward in "Jervis on Coroners" should be regarded as the law on the subject, completely ignoring the fact that the pious private opinions of that worthy gentleman, unqualified by any definite ruling on the point at issue, do not rise to the level of authority. Even admitting "Jervis on Coroners" to be correct in stating the law on this point—i.e., this duty devolves upon those who are in attendance on or about the deceased *at the time of death*—I fail to see how such a ruling can affect the medical practitioner in the *majority of cases* which call for an inquest or an inquiry by the coroner—cases in which no medical practitioner is in immediate attendance on the deceased *at the time of death* or in which the only attendance on or about the deceased commenced *after his death*.

The savoury threats held out by the council of this *private* society of "an indictment at common law for not *fully* stating the cause of death" may be ignored by all *who act in good faith*. For should any such action be entered, the *onus* of proving "*evil intent*" and "*wilful* suppression of the truth" must fall on the plaintiff. *Apropos* "the law relating to coroners," may I ask Mr. Braxton Hicks for a statement of the fees paid to the medical profession for reports (expert opinion) regarding the cause of death in cases closed by an inquiry without inquest, the reports being forwarded the coroner at the request of his officer? The coroner for the ancient city of Rochester pays, and prior to 1897 the coroner for the Sittingbourne

district, Kent, has paid, a fee of 10*s.* 6*d.* for each report. Sequent to 1897 this fee has been disallowed by the Kentish County Council, and medical men thereby burked of their legitimate dues. My professional brethren should note that in dealing with a coroner who refuses to pay for such reports not to furnish him or his officer with any expression of a professional opinion as to the cause of death without a subpœna.—I am, Sirs, yours faithfully,

CLARENCE A. WRIGHT, F.F.P.S. Glasg., F.R.C.S. Edin.

Leytonstone.

"DEATHS UNDER CHLOROFORM."

To the Editors of THE LANCET.

SIRS,—With reference to the letter of Lieutenant Clayton Lane, I.M.S., at page 731 of THE LANCET of March 10th will you permit me to draw attention to a few points which he has apparently overlooked? I quite admit that my opinion, or "guess" as he prefers to call it, is based on purely circumstantial evidence; that is perhaps unavoidable in such cases. Lieutenant Lane assumes that the respiration began to fail first, but why he should do so is somewhat difficult to conceive since the report states that "the breathing continued being slow and stertorous" some time after the appearance of dangerous symptoms.

Again, as the medulla is one of the last parts of the brain to become affected by chloroform, respiratory paralysis only comes on in the late stages of anæsthesia; in the case in question the dangerous symptoms appeared in the second or excitement stage, while even the superficial reflexes were still active. While agreeing and sympathising with Lieutenant Lane in his regrets at the incompleteness frequently observed in the reports of deaths under chloroform, a little reflection confirms one in the belief that many of the defects are unavoidable so long as the patient's life is considered of more importance than the solution of a purely scientific problem.—I am, Sirs, yours faithfully,

GEORGE MOWAT, M.B., Ch.B. Aberd.

Royal Infirmary, Wigan, March 19th, 1900.

NOTES FROM INDIA.

(FROM OUR SPECIAL CORRESPONDENT.)

Famine and Plague in India: Four Millions of People Under Relief.—The Recrudescence of Plague in Calcutta.—The General Mortality in Bombay, 170 per 1000 per annum.—The Enormous Plague Expenditure.—The Terrible Mortality in Bombay.—Increase of Plague in Calcutta.

FAMINE and plague are the two chief factors of medical interest at the present time. The famine is of almost unparalleled magnitude and is very widespread. The numbers in receipt of relief have now approached four millions and increases are weekly reported from several provinces. No such number of persons has ever before been simultaneously relieved by any Government in the world. Unfortunately there is every likelihood of these totals being still further increased during the spring and summer months. In Western Rajputana 90 per cent. of the cattle have been lost. Except in some native states mortality from famine has been almost completely suppressed. There are not now, as on former occasions, the "poor emaciated wastrels, the living skeletons, whose pitiful likenesses nearly broke our hearts when they appeared in the illustrated papers three years ago." Public charity has been called for and the call has been grandly answered. Some of the native princes have given liberally. The distributers of the famine fund make no discrimination between the claims of native States and British India. It is perhaps only in this famine that organised relief in native territory has been carried out, as in 1897 such relief was experimental. The famine is now most severe in the native States.

Points of interest about the plague epidemic continually arise. The disease has now taken hold of Bengal and is spreading fast. As I predicted there is a recrudescence in Calcutta. The plague mortality has been rising steadily since the end of January and the returns for last week show 199 deaths. The outbreak in Calcutta has not yet alarmed the native mind and large numbers still refuse to believe that the disease is plague at all, but comfort themselves with the title of bubonic fever, milder forms of which they think they have known in Bengal for many years. The regulations being so mild there is no ground for any complaints against the authorities. Should plague really develop seriously, as in Bombay and Poona, the organisation must show itself as helpless as it is insufficient. The rate of general mortality now exceeds 50 per 1000 per annum, the normal being about 37. There is every indication of a very serious development. The outbreak in the Patna district has much increased but it does not seem to have attracted much public attention. Nearly 1000 deaths occurred last week. The people refuse to follow the traditional plan of evacuation which has proved so successful in Dacca, Faridpur, Backergunge, and in Darbhanga. Someone appears to have poisoned their minds just in the same way as someone poisoned the minds of the people of Calcutta with regard to inoculation. The consequence is that the disease has spread rapidly and is now threatening South Behar.

Of Bombay city the record is terrible, no less than 2701 deaths having occurred during the past week. The number of those dying from plague is greater than has ever been known. The death-rate is over 170 per 1000 per annum. The official returns only give the small number of 641 deaths from plague. Small-pox is still raging but probably does not account for more than 300 deaths in the week.

The plague expenditure in Bombay has been very large. A recent return shows that up to Dec. 31st, 1899, the total expenditure was Rs. 4,081,208 (equal roughly to about £270,000). During the past year, that is, since the dissolution of the Plague Committee, the expenses have been much reduced, but, still, during this period something like £35,000 have been spent on plague administration. The returns for the whole of India give 2597 deaths from plague. It would probably not be far wrong to double this estimate. In the Jullunder district of the Punjab more villages are being attacked. The recrudescence at Karachi has aborted and the plague mortality has now sunk to very small dimensions. These abortive attacks have occurred at other places, but there seems no explanation to account for them. Though not serious in themselves they keep the disease slumbering ready to awaken to renewed activity at a future period. I am afraid that they form no indication of a decadence of the epidemic.

The latest weekly plague statement for India ending Feb. 24th shows a marked increase in the number of deaths and the week closes with 3184 fatal cases, against 2597 in the previous week. The increase is due to the further development in Bombay and in the Bengal Presidency. In Bombay city the general mortality again surpassed the previous maximum and 2831 deaths were recorded. Of this number 263 were attributed to small-pox, but the official figures only return 768 deaths as due to plague. If the truth were known probably 2000 deaths occurred from plague alone. This terrible general mortality very nearly touches a rate of 180 per 1000 per annum. In Calcutta the outbreak is developing very rapidly and now after only five weeks' increase the plague mortality is double what it amounted to during the worst week of last year.

I regret to say that the rapid increase and the discovery of more living cases foreshadow a still further development of the outbreak. The general mortality at the present time exceeds the average by just about the number of the plague deaths and there is no other epidemic to account for the excess. In the Patna district the disease has spread considerably and 1444 deaths were returned for last week. I regret to have to record a renewed activity at Karachi, fresh outbreaks in the Punjab, and that six fatal cases have been reported from Aden.

Feb. 26th.

UNIVERSITY OF DURHAM FACULTY OF MEDICINE.—Dr. Percival Davidson is now in South Africa with the 5th Battalion Imperial Yeomanry (including Northumberland and Durham and Shropshire Companies), to which he is surgeon. Dr. Davidson is a graduate of Durham University and was for some time senior house physician at Newcastle Royal Infirmary. Dr. W. L. W. Walker, a graduate of Durham University, who was mentioned in THE LANCET of March 10th (p. 739) as being attached to one of the South African Companies of the Northumberland Yeomanry, is attached to a hospital on the lines of communication.

THE ORGANISATION OF THE PROFESSION.

NORWICH.—ABORTIVE ATTEMPTS TO DEAL WITH CLUB PRACTICE.—GOOD RULES THAT ARE NOT APPLIED.—THE RÔLE OF THE MEDICO-CHIRURGICAL SOCIETY.

(FROM OUR SPECIAL COMMISSIONER.)

THE position of affairs at Norwich is certainly not encouraging. This town may serve as a typical example of difficulties that have not been overcome and yet where some efforts have been made to deal with the existing grievances. So far back as the month of April, 1897, a meeting of all the members of the medical profession was held in the library of the Norwich Medico-Chirurgical Society. Most of the practitioners of the county belong to this association and it meets once a month for the purpose of reading scientific papers. When, however, ethical questions became prominent they were also discussed. Some of the members urged that energetic measures should be taken, others were opposed to any such action, and during the year 1896 so many heated discussions occurred that some fears were expressed that the association would be broken up. However, the reform party was so far successful that at the annual meeting for the year 1896 a new rule was accepted and worded as follows:—

> Any registered medical practitioner who shall be adjudged guilty of, and persist in, unprofessional conduct as defined by the code of rules adopted by this society shall be ineligible to be a member of this society.

It was, however, easier to adopt rules than to enforce their application. Some of the local practitioners were receiving incomes from the medical aid organisations. In one case such income was said to amount to about £300 annually and it was stated that paid canvassers were employed. In reply it was urged that the canvassers were only collectors and did not tout. Indeed, as the discussion continued, it seemed as if the application of the new rule would involve the expulsion of the greater part of the members of the Medico-Chirurgical Society. Many practitioners had also private penny clubs of their own. Others had commenced practice in Norwich as the salaried officers of the Friendly Societies' Institute and then had taken some of the patients away from this institute and thus built up for themselves a private practice. They were therefore not very anxious to abuse the bridge on which they had crossed. Others complained that the Friendly Societies' Institute had been the means of introducing a low class of medical men into the town and this accusation did not tend to sweeten the acerbities that arose. Thus, it was found that while most of the practitioners were ready enough to throw stones each had his own particular skeleton which he was anxious to conceal. If the rules were strictly applied terrible ruptures would ensue, old well-established social ties would be broken; and there seemed to be no leader, no organised force, to give a direction and to indicate a policy that could unite the profession and bring about an attack on the line of least resistance.

In one respect Norwich was in a much less favourable position than the neighbouring town of Yarmouth. At the latter town the medical practitioners had with great unanimity constituted a medical union before the friendly societies established their medical institute. At Norwich, on the contrary, a similar institute had been in existence for about a quarter of a century. Some 25 years ago the medical practitioners only received 3*s.* per annum from the members of the benefit societies and for this small sum they had to give medical attendance and medicine. A movement leading up to a sort of strike was then started among the members of the profession, but there was a lack of unity. Still, the agitation, though not sufficiently unanimous to obtain the desired reforms, nevertheless seriously alarmed the friendly societies and led them to form an amalgamation by which the Friendly Societies' Medical Institute was created, and here they employed two medical men at fixed salaries. Most of the clubs or benefit societies went over to this institute, but some of them agreed to pay more and retain the services of their medical officers. Now that this institute has existed so long and has acquired well-established vested interests it cannot be combated with the same facility as could the newly established institute at Yarmouth. The Norwich Friendly Societies' Medical Institute has probably some 10,000 members. It employs two medical officers and one of them lives on the premises. Sir Peter Eade and Mr. Cadge were the consultants, but when all the grievances were exposed and the evils of the system were made manifest both the consultants sent in their resignations, so that the efforts made have not been altogether futile.

There is also the Norwich Free and Provident Dispensary which is a semi-charitable institution, being supported partly by the subscriptions of the members and partly by donations. It employs seven medical officers who are paid according to the number of members on their list, the highest payment being £300 and the lowest £80 per annum. The question naturally arose as to whether this dispensary could be considered as an organisation worthy of support by the medical profession. This was soon brought to a test. Seeing how deeply the practitioners of Norwich are involved in the system of contract work it seemed impossible suddenly to put an end to the clubs or medical aid organisations. Therefore at the general meeting held by the profession in April, 1897, an attempt was made to meet these difficulties, not by abolishing contract work but by substituting for the existing institution a provident medical service organised and managed exclusively by the medical profession. In a word, Norwich sought to imitate the example set by Eastbourne and Coventry. Previously to this a committee had met on six different occasions to draft a scheme. According to this proposal a dispensary was to be established with the title of the Norwich Public Medical Service. There was to be a central office where patients could attend to obtain advice and medicine. At Coventry and at Eastbourne it may be noted that there is no such office and some doubts may well be entertained as to the wisdom of having such a central office or dispensary. It adds considerably to the working expenses and compels the medical officers to absent themselves from their own surgeries so as to attend at the dispensary. The patients on their side have to go greater distances and have to crowd together in a waiting-room where they may lose a considerable amount of time. As a rule the patients prefer going to the private surgery of a medical practitioner living in their immediate neighbourhood. However, this is only a practical question and not a matter of principle. The Public Medical Service, of course, was to be self-supporting and was to be governed by an elected committee. All qualified medical practitioners, not practising as homœopaths and having resided 12 months in Norwich, might become members of the medical staff if they signed an undertaking not to accept in future any club offering less remuneration. Further, they were to have no professional intercourse whatsoever with any practitioner who was connected with medical aid societies or similar institutions if the latter canvassed for members in the interests of individual practitioners, had not imposed a wage limit, and virtually sweated their medical officers by making a profit out of their work and paying them inadequately. The Public Medical Service was to accept as members artisans and their families and others who might be considered suitable by the committee if they made correct statements as to their income or weekly wage and if this did not exceed the sum of 35*s.* per week. The candidates were to be medically examined and, if accepted, charged 6*d.* entrance fee and 2*d.* for their cards. After that adult males and females would have to subscribe 4*d.* per month and children under 14 years of age 2*d.* per month. A family, however numerous, would not be charged more than 1*s.* per month. Several practitioners protested that the payment for adult females should be 6*s.* per annum as they required more attendance than males. Members more than 60 years old or actually in ill-health when joining were to be charged an entrance fee of 5*s.* Domestic servants were not to claim attendance at their employers' houses. If a member's income increased and exceeded the wage limit he was to be struck off the books. The fee for confinements would be 20*s.* payable in advance, miscarriages 10*s.*, and vaccinations 2*s.* 6*d.* There was to be also a special scale for surgical operations. Of course, the members were free to select their medical attendant. The committee that prepared this scheme consisted of 14 practitioners and it was adopted at the general meeting of the profession held in April, 1897.

Unfortunately the iron was not struck while it was hot. Shortly after this meeting a deputation went up to London to discuss the entire question with the General Medical Council, the Royal College of Surgeons of England, and the Royal College of Physicians of London. Much time elapsed

before this deputation presented its report and then it seemed that nothing very satisfactory had been done. Indeed, the visit to London acted as a sort of wet blanket and the enthusiasm which had at first been evoked cooled down. All the practitioners of Norwich were still anxious that the Public Medical Service should be established, but each individual preferred that others should begin and reserved for himself the privilege of joining later, when the enterprise would have proved successful. The Council of the Norwich Medico-Chirurgical Society sent out notices reminding members of the rules and then it was proposed to report all practitioners who failed to observe them. But this was only a threat, no one seemed to have the courage to act. There was some talk, but it was only talk. At last it was suggested that an effort should be made to work with the Norwich Free and Provident Dispensary, and that the scheme of the Medical Service should be welded with that of this old and well-established institution. The Dispensary, however, did not feel inclined to open its doors to all the practitioners of the town. The members were willing to add two medical officers to their staff, but that was all. Of course this would only increase the existing evil. The complaint against all dispensaries of this description is that they create a monopoly, as is illustrated by the provident dispensaries of Leicester, Coventry, Northampton, and the like. Under the mantle of charity and with the aid of a lay committee a small body of medical practitioners get an enormous list of patients and more than their share of such contract work as may be necessary to secure medical attendance for the poorer classes. The true course, of course, was to throw this work open to all practitioners, and it was no solution of the difficulty to increase the number of privileged practitioners on the staff of the Dispensary. The remedy consisted in the abolition of all privilege. Some of the medical officers were on the managing committee of the Norwich Free and Provident Dispensary, and they, at least, should have understood this, but they altogether failed to prevent the adoption of the proposal to add two more medical practitioners to the Dispensary staff. Thus so far the attempt to establish a Public Medical Service has done more harm than good.

Yet in spite of all this weakness and all these failures there is a strong feeling in favour of reform and a desire to act; but there is neither leadership nor unanimity. Thus individual practitioners are fighting by themselves; there is a sort of guerilla warfare and no disciplined concerted action. For instance, the two medical officers who are in the employ of the Friendly Societies' Medical Institute are consistently boycotted; no one will meet them, and if one of their patients requires a second opinion or consultation the patient calls alone on one of the consultants and pays his guinea fee. Such payments being frequently made prove that many members of the Friendly Societies' Medical Institute have incomes that exceed any reasonable wage-limit. There are likewise many members of the Independent Order of Oddfellows, Manchester Unity, who are in good positions. These are tradesmen, yet they only pay 4*s.* a year for medical attendance. If it is necessary to perform an operation on one of the members of the Friendly Societies' Medical Institute the operating surgeon writes to the medical officers of the Institute and warns them to keep away. Thus a case was related to me of a member who had suffered from typhoid fever and was attended through this illness by the medical officer of the Friendly Societies' Medical Institute though he only paid 3*s.* per annum. When, however, it was necessary to perform an operation on the wife of this member he engaged a leading surgeon of the town and paid him £20. If he could pay £20 for his wife it seems obvious that he could have paid more than 3*s.* for medical attendance on himself during so serious an illness as typhoid fever. Thus there can be no doubt as to the abuse that prevails. Still the members of the profession do not know how to act.

If little or nothing has been done in respect to club practice some improvement has been effected in regard to hospital abuse. The members of the medical staff of the Yarmouth Hospital raised this question and awakened the admission committee from its dormant condition. A board was put up explaining that the hospital was a charitable institution intended only for the relief of the poor. The practice of receiving paying patients at the hospital was abolished and during the course of the year a few patients have been refused admission on the ground that they could afford to pay the usual fees. Also club patients were in the habit of coming to the hospital. This has also been abolished and now none are admitted unless at the special and written request of their club medical officer. As a result of these measures it is thought that the abuse of the out-patient department is not so prevalent as it was formerly. There is no agent to inquire at the patients' homes, but the porter is a shrewd man and he keeps a sharp look-out. One of the clerks also is well acquainted with the members of the benefit societies and he helps to prevent abuse.

The question arises as to what should be done. At present the body which is best able to deal with the points at issue is the Norwich Medico-Chirurgical Society. It possesses close upon 150 members, of whom about a quarter reside in Norwich. According to Rule 1 its object is not only the cultivation and promotion of medicine, surgery, and the branches of science connected therewith, but also the "consideration of public matters affecting the profession" and the support of a medical library. Therefore the dealing with ethical and economical questions is quite within the scope of the accepted programme. Further, Rule 6 states, as already mentioned, that any registered medical practitioner who shall be adjudged guilty of unprofessional conduct shall be ineligible as a member, and it adds:—

> The rules adopted by this society are those formulated by Dr. Styrap, with clause appended with regard to medical aid associations, defined as associations formed as trade speculations, carried on by lay proprietors for the purpose of deriving pecuniary profits from the earnings of members of the profession, and pushed by means of advertisements or by the employment of paid canvassers who tout and solicit the patients of other practitioners; and that it be deemed unbecoming and unprofessional for any member of the profession to lend his name or to associate himself in any way with such societies or clubs.

We have seen, however, that so far this rule has not been properly applied, and there is a natural tendency to inquire whether any other form of organisation would be able to deal more efficaciously with these problems. There also exists the East Anglian Branch of the British Medical Association, but it does not often discuss ethical questions. Nor does it meet regularly in any one particular place, but has gatherings in different towns, so that it may not meet in Norwich more than once in the course of three years. What is required is a medical union formed to deal exclusively with ethical and economical questions and this in a militant and constant manner. Such a union would consist of those who were in active practice in the town, but the fact that it had been created by the Medico-Chirurgical Society would bring up the support of a large number of practitioners established in neighbouring towns and districts. This would be most useful, notably in preventing the importation of medical practitioners to take up the work which members of the medical union might in view of obtaining necessary reforms refuse to undertake. The Medico-Chirurgical Society may convoke a meeting of the entire profession and then open its doors to all comers, but that does not suffice. A permanent link must be established. The practitioners must be brigaded and they must be brought under some form of discipline which shall harmonise with the opinions of the majority. The members must exercise some ingenuity to render such a union and its gatherings attractive to those who might otherwise be inclined to hold aloof. There are courtesies and civilities that are sometimes more effective than the most telling arguments. Nobody really likes to be ostracised, and before war is definitively declared all arts of persuasion should be employed. This is the work of a union rather than of a somewhat exclusive social and professional club; and it is for these reasons that the Norwich Medico Chirurgical Society might be well advised in seeking to establish a medical union of a militant character.

MANCHESTER.

(FROM OUR OWN CORRESPONDENT.)

Bakers and Confectioners' Exhibition.

THIS is an age of exhibitions and Manchester is seldom without one. That now being "run" is in connexion with the pastry-cooks, confectioners, bakers, and allied trades of the United Kingdom, and it is held under the auspices of the National Association of Master Bakers in conjunction with the Manchester and Salford Association, of which bodies most of us are, it is to be feared, grossly ignorant. It is held in St. James's Hall, was opened on March 12th, and is the fourth of its kind. It seems that the prizes to be given amount to £250. It is no doubt a good thing that there should be as few secrets as possible with regard to the preparation of food, but it is by no means clear

that the public will learn much from seeing the finished products of the confectioner's art. The exhibition remains open till March 21st and daily judging of the bread and confectionery takes place. It is questionable if what is called the main feature of the exhibition is specially conducive to speedy and unobtrusive digestion, for it consists of a fine show of bridecakes in all their artistic beauty. This show is said to be unique, or, as the report says, "*somewhat* unique, no such artistic display having been seen not only in the provinces but even in London." Perhaps the bride-cake has caused some obscurity in the language. There is more in the art of confectionery than a mere ordinary man supposes. The President said that "the exhibits were wonderful examples of excellence and accuracy of touch which was only to be acquired by constant and lengthened practice," and a gentleman from Hull, the President of the National Association of Master Bakers and Confectioners, said that "the bakers produced the best of bread and the confectioners exhibited bridecakes and fancy confectionery which were most artistic in design and in workmanship and quality." We shall, no doubt, hear before long of a Burne-Jones among the bakers or a Dante Rosetti among the confectioners. It gives one a shock to remember amid all this the stories—true not long since—of phthisical bakers toiling amidst the foulness and heat of ill-ventilated, underground bakehouses. Are any of these stories true now?

Asylum Accommodation in Cheshire.

Notwithstanding the recent enlargement of the Cheshire Asylum at Upton, Chester, which has given altogether accommodation for 1000 patients, the asylum at Parkside, Macclesfield, needs enlargement. At a joint meeting of representatives of the Cheshire County Council and the county boroughs of Stockport and Birkenhead, held on March 9th at Crewe, plans for the enlargement were approved. The arrangements will allow of the best classification of the various phases of lunacy. The cost per bed is estimated at £250 and the total cost of the enlargement at £70,000. But this is not expected to be sufficient for more than 10 or 12 years. A proposal has been made that cottage homes should be established for imbeciles and chronic, helpless, and infirm patients who want nothing more than care and nurture.

Preservation of Milk.

As the use of most of the preservatives for milk is so much objected to, it is interesting to note a method of treatment described at a recent meeting of the Manchester Literary and Philosophical Society by Dr. F. H. Bowman. He stated that very promising results had been obtained with regard to the preservation of milk by slowly bubbling sterilised air through it. There was no loss of flavour or of nutritive value. Care must be taken to keep the agitation within such bounds as will avoid the effects of churning. Dr. Bowman promised to make a further communication on the method if it proved of practical importance.

Small-pox Hospital for Manchester.

The Manchester Corporation are seeking powers to borrow £60,000 to build a small-pox hospital on Carrington Moss and a lengthened inquiry is being held in the town hall by Dr. S. W. Wheaton, the commissioner representing the Local Government Board. As may be known to many of the readers of THE LANCET the land was bought some years ago in order to get rid of, and to utilise, nightsoil and other refuse by the aid of which several thousand acres of waste land have been reclaimed and rendered productive. The corporation propose to reserve 55 acres for the hospital and its surroundings. It is difficult to find sites remote from dwellings in this populous district and it would be extremely difficult to find another so isolated. Of course, the opposition is strong, as it would be anywhere. The result of the inquiry cannot be foretold, but if this site is rejected there will be great difficulty in procuring a small-pox hospital for Manchester.

March 20th.

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

Royal Edinburgh Hospital for Sick Children.

SEVERAL appointments have just been made in connexion with the Royal Edinburgh Hospital for Sick Children. Dr. John Thomson has been appointed one of the ordinary physicians in place of Dr. John Playfair whose term of office has expired. Dr. James Stewart Fowler has been appointed to be one of the extra physicians to the institution.

Scottish Association for the Medical Education of Women.

The tenth annual report of the Scottish Association for the Medical Education of Women shows that during the year ending Sept. 30th, 1899, the total receipts amounted to £2395 2*s.* 6*d.* and the total expenditure to £2381 19*s.* 6*d.* At the beginning of the winter session, 1899–1900, 105 students paid the matriculation fee of the College.

The Edinburgh and East of Scotland South African Hospital.

The scheme for a hospital for wounded soldiers in South Africa which was originated a few weeks ago by Lord Provost Mitchell Thomson has been most warmly supported in the East of Scotland. It will be remembered that in the first place the suggestion was that Scotland should provide a hospital ship which would cost about £60,000. Negotiations on the subject were opened with Glasgow, but as that city was unwilling to coöperate the scheme was dropped. The Lord Provost, however, at once took up the lesser undertaking of providing a hospital for the front, and so enthusiastically was the matter taken up by the citizens that in little more than a month practically the whole of the necessary funds were subscribed in Edinburgh and the East of Scotland. It was estimated that for a hospital of 100 beds, to be placed on the lines of communication, a sum of from £12,000 to £20,000 would be necessary. The Lord Provost raised over £6000 of the amount needed before he made a public appeal, and the sum now raised is only a few hundreds under the £20,000. The hospital is to be what is known as a stationary hospital on the lines of communication. The premises will consist of four wards and an administrative block. They will be made of corrugated iron, with wooden floors and a canvas lining. The wards will be each 128 feet in length, 19 feet in width, and eight feet in height to the rafters, across which will be stretched a canvas ceiling. The administrative block will be 185 feet long, 28 feet wide, and nine feet high, while there will be smaller out-buildings for various purposes. Each ward will have 25 beds, with surgery, dispensary, and lavatory accommodation attached. The administrative block will contain separate rooms for the medical staff and nurses, a dining- and recreation-room, and dormitory accommodation for the orderlies. First-class electrical apparatus is being taken out which will furnish electric light to the hospital and will enable the surgeons to make use of the x rays. A soda-water machine, large enough to supply the whole of the hospital with soda-water for ordinary drinking purposes, forms part of the equipment of the hospital, as well as a Chamberland-Pasteur filter, a Berkefeld field service filter, and several smaller filters. The wards will be erected parallel to each other with a space of 60 feet between them. The administrative block will be set at right angles to the other premises and will be stationed 150 feet behind them. These erections, which were supplied by Messrs. Humphreys of Knightsbridge, were set up in London, have been passed by the War Office, and have been inspected by the members of the Executive Committee. As the huts are in numbered sections the putting of them up or taking them down will not be difficult. A large stock of medical comforts, including champagne, brandy, whisky, and other liquors, has been presented to the hospital by merchants and others as a token of their interest in the scheme. The drugs and instruments are all of the best and have been supplied by Edinburgh firms. The details of administration have all been already thoroughly worked out, so that the hospital will be ready for use whenever it arrives in South Africa. The hospital staff is to consist of 64 persons. The chief executive officer will be Sir James Clark, Bart., Major, Royal Army Medical Corps. The civilian staff will consist of Professor Chiene as head and Mr. David Wallace as second in command, while Dr. Francis D. Boyd will act as physician to the hospital. There will be four assistant surgeons—Mr. A. H. Watt, Dr. C. M. Cooper, Dr. G. L. Chiene, and Dr. James Miller. The members of the staff will be inspected before leaving Edinburgh by the general commanding in Scotland and will leave Southampton on March 24th on board the *Briton*. On March 18th the medical and nursing staff of the hospital attended the military service in St. Giles's Cathedral. The sermon was preached by the acting chaplain to the forces, the Rev. Dr. Theodore Marshall. After the service the medical

men were addressed by the Lord Provost in the Royal Exchange-square.

Exhibition of Hybrids.

Professor Cossar Ewart is organising an exhibition of zebra and other hybrids to be held from April 2nd to 7th in the Waverley Market, Edinburgh, in aid of the War Relief Funds. He will be glad to receive loans for the week of hybrid beasts, birds, or fishes.

Recital in Aid of the Royal Army Medical Corps Fund.

On the evening of March 14th a musical and dramatic recital was held in the hall of the Edinburgh University Students' Union in aid of the Royal Army Medical Corps South African Fund. The Edinburgh University Musical Society performed several choral pieces, while Miss Clouston, Miss B. Stewart Richardson, and several students supplied the dramatic element. The hall was completely filled. The audience included General Chapman, C.B., and staff, and the Presidents of the Royal Colleges of Physicians and Surgeons of Edinburgh.

Dundee Surgeon for South Africa.

Dr. D. M. Greig of Dundee has received an appointment in connexion with the South African Field Force. Dr. Greig served in the Royal Army Medical Corps for three years after he graduated and began practising in Dundee in 1889, where he holds the rank of Surgeon-Captain in the 1st Forfarshire Volunteer Artillery.

University of Aberdeen.

Rev. John Marshall Lang, D.D., at present minister of the Barony Parish Church, Glasgow, has been appointed Principal of Aberdeen University in succession to the late Sir William Geddes. Dr. Lang is a graduate of Glasgow University and is the author of several religious works. In 1856 he was inducted to the charge of the East Parish, Aberdeen, a post which he filled for two years, but otherwise he has had no special connexion with the "Granite City."—The prospects of the University Buildings Extension Scheme have now considerably improved. Both the town council and the University Court have agreed to adopt the "popular" plan, which provides for the removal of Old Greyfriars Church and the erection of a new church at the junction of Queen-street and Broad-street, and the latter body has acquired at an expense of £10,065 the property required to provide a site for the new buildings, which will cost £10,000 more. For their part the Greyfriars Kirk Session agree to withdraw the legal process raised against the two bodies first named on payment of expenses. The deadlock in the University Buildings Extension Scheme has thus been removed, and if funds can be obtained it will be an easy matter to complete it in such a way as not only to enlarge the Marischal College buildings, but also at the same time to bring about an important street improvement.—There are 67 entrants for the medical preliminary examination which commences on March 23rd.

March 20th.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

The Dublin University Biological Association.

AT the last meeting of the Dublin University Biological Association, which took place in Trinity College on March 15th, a paper was read by the President, Dr. W. R. Dawson, on the Pathological Study of Insanity. After the discussion the following motion was proposed and passed unanimously:—

That in the opinion of this association it is desirable to establish a central laboratory for the Irish asylums devoted to the study of pathology in relation to nervous and mental diseases.

The Dublin Public Health Investigation Committee.

After a recess of a fortnight's duration the Public Health Committee resumed their sitting on March 20th at the City Hall.

Belfast Port Sanitary Authority.

Mr. Agnew, Local Government Board inspector, held a public inquiry at Belfast on March 14th in reference to an application made by the county borough council of Belfast to the Local Government Board to be constituted the "Port Sanitary Authority" for the whole of Belfast Lough. At present their jurisdiction is confined to that portion of the lough abutting on the city and authority is spread over different bodies who have no means of carrying out the required sanitary regulations. Evidence showed that when a ship arrived in Belfast Lough outside the borough limits carrying the yellow flag then the medical officer of health of the board of guardians took charge of the vessel and he had to get the assistance of the Belfast Corporation public health officials for disinfection, &c., and the expenses had to be borne by the districts outside the borough of Belfast who really had at present no arrangements to deal with such cases. There is no question but that it would be much wiser to have one central authority—the Public Health Department of the Belfast Corporation—to deal with the whole lough. The only opposition was from the local rural districts abutting on Belfast Lough who claimed that the Local Government Board had no jurisdiction to tax the districts in the neighbourhood of the lough except they formed a joint board, a course which would ensure taxation and representation going together. They objected to being taxed for the benefit of the port of Belfast. The evidence taken will be sent to the Local Government Board for its decision. The wise course would be to have one central authority vested in the city.

The Mater Infirmorum Hospital, Belfast.

This new hospital is to be opened by the Lord Mayor of Belfast on April 23rd, when addresses will be delivered by Cardinal Logue, the Marquis of Dufferin and Ava, the Right Hon. W. J. Pirrie, and the Roman Catholic Bishop (Dr. Henry). It is expected that the institution will be opened free from debt.

March 21st.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

The Degree of Doctor of Biological Science.

BESIDES the degrees recognised by the State the universities of France can grant degrees exclusively scientific but which confer none of the rights or privileges belonging to the State degrees and which must in no case be declared as equivalent to them. Of the seven faculties of medicine in France four possess the right to present for a university doctorate as regards medicine. These four are Paris, Bordeaux, Lyons, and Nancy. This last body is not content with her university powers and demands the right to present for a degree persons who have shown their especial knowledge in biological science. The council of the University of Nancy has agreed to this proposition and accepted it at a special meeting on Feb. 12th. The resolution has just been approved by the Minister of Public Instruction, and so, starting during the present scholastic year, the Faculty of Medicine at Nancy is authorised to present for the new degree, which is the first of the kind to exist in France. The testamurs (*attestations*) in the higher studies in biology which have to be submitted are three in number—one for anatomy, one for physiology, and one for microbiology. The subjects of study for each testamur are also three in number, two of them being compulsory and dealing with the special subject of the testamur, and the third being optional, which the candidate can choose from a given list. The subject must be approved by the professor and after this the sole test consists in the candidate showing that his knowledge of the question chosen is thoroughly up-to-date (*mise au point*). The written dissertation must be accompanied by specimens or illustrations bearing on the question, such as sections, diagrams, charts, or anatomical preparations. A candidate who has gained his testamur may present himself for the degree of Doctor in biological science. A thesis is also required showing personal acquaintance with the facts of biological science, which thesis must be defended in public. Before the defence the manuscript must be submitted to the different members of the jury who will decide as to its merits. The public defence of the thesis follows upon this previous test.

The Sanitary Condition of Paris.

The question of a supply of wholesome drinking-water continues to occupy the attention of the sanitary authorities and has also come up in Parliament. The recent epidemics in the schools have furnished Dr. Treille, a senator, with an opportunity for asking the Minister of Public Instruction a question. Dr. Treille said that he was not in sympathy with the modern theories of the microbial origin of the

disease. Water was not the principal cause of infection and typhoid fever was due to the insanitary condition of old buildings and to disturbances of the earth owing to the works recently carried out for repairing the drains and sewers. The Minister, naturally enough, replied that the organisation of the schools was perfect; they were supplied with spring water for drinking and the water of the Seine was only used for washing down the yards. The committee charged with the inquiry into the causes of the epidemic have unanimously agreed that the contamination of the drinking-water mains arose from an accidental communication having been established between them and the mains conveying the Seine water. Since an order was given for all drinking-water to be boiled the epidemic has disappeared. The remarkable views of Dr. Treille are a strange confirmation of the blind confidence which the city engineers have in the water which they supply, whence it follows that they are in the habit of saying, whenever an epidemic breaks out, that the fault rests anywhere but with them. Dr. Thoinot, the secretary of the Consultative Committee of Hygiene, has been put in disgrace for having, in a communication made to the Academy, too freely made public the causes of the original insanitary conditions which go far to render useless the great sacrifices which the city of Paris has made to procure a really wholesome supply of drinking-water. One of Dr. Thoinot's pupils, Dr. Arago, has just presented a thesis for the degree of Doctor of Medicine, called "The Avre, the Vanne, and the Dhuys: a Study in Parisian Sanitation," which he defended before the Faculty of Medicine at Paris and which has excited much interest. In this thesis he agrees with Dr. Thoinot and says that all water supplied by the city should be boiled before using for drinking or in the preparation of food. This statement, which is not very re-assuring, has been reproduced widely in the lay press. The Assistance Publique is very busy preparing for hospital accommodation for cases of infectious diseases in view of a possible epidemic and also in view of the increased number of cases of illness to which the Exhibition, as is always the case, will give rise. It is intended to build a new infectious hospital at Ivry just outside Paris close to the present infectious hospital, but as this cannot be ready for a long time the Assistance Publique will for this year content itself with enlarging and improving the present temporary hospital at Aubervilliers. The existing huts will be restored and two new wards, each containing 24 beds, will be erected. The total cost will be 71,000 francs and the Assistance Publique will thus have 418 new beds for infectious diseases at its disposal, a number which after all is too little for the inevitable rise in the sick rate which the Exhibition is sure to bring about.

Spitting on the Pavement.

In my letter in THE LANCET of Jan. 6th, at page 68, I mentioned that the Municipal Council of Paris had decided to put up enamelled metal notices in the chief streets requesting the public, with a view to avoiding the dissemination of infectious disease, to refrain from spitting on the pavement. This decision was taken on the initiative of M. Fortin. The question came up again at the meeting of the council held on March 16th, when it was decided that instead of enamelled plaques posters should be provided lettered as follows: "In the interests of public health and to avoid the dissemination of tuberculosis you are requested not to spit on the ground." These posters will be put up in the streets and in the public gardens. The railway and omnibus companies are also to be approached with a view to these posters being put up in the stations, waiting-rooms, railway-carriages, tramcars, omnibuses, and other vehicles. Measures are also to be taken to have both the roads and footways washed down.

March 20th.

ROME.

(FROM OUR OWN CORRESPONDENT.)

International Hygiene: The Lazzaretto of Mogador.

ITALIAN diplomacy has scored a point in the interests of international hygiene. The island of Mogador, opposite the seaport of that name on the Atlantic littoral of Morocco, had for some time been used as a lazzaretto for the pilgrims of the Sultanate who, on their return from Mecca, had to be subjected to quarantine. The use of the island for that purpose, however, was never agreeable to the Court of Fez which, through the Government of Tangier, adopted something more than a policy of "pin-pricks" towards the Powers at whose instance the lazzaretto was maintained. Matters, indeed, had come to this pass that, on the expiry of the last quarantine, the Governor of Tangier ordered the physicians and agents of the "Council of International Sanitation" to be expelled the island and, at the same time, destroyed the buildings and huts in connexion with the lazzaretto. The situation had become very serious when, on the part of the "Council," the Italian envoy at Tangier, the Commendate Malmusi, undertook to re-establish the *status quo antea*. A better intermediary could not have been found, for Signor Malmusi is eminently a *persona grata* at the court of the Sultan, besides possessing much diplomatic experience and tact. He has succeeded accordingly, and has just announced to the Consulta (Foreign Office) that all difficulties have been amicably resolved; that the lazzaretto will be re-constituted on the old lines; that the agents of the "Council" will remain unmolested at their posts; and that for purposes of quarantine and sanitary interests in general the island of Mogador is henceforth international property.

In Memory of Italy's Surgeons fallen in Battle.

This afternoon witnessed a touching ceremony at the Army Medical Hospital on the Caelian Hill. It was the unveiling in the *atrium* of the hospital of a memorial tablet inscribed with the names of 35 surgeons, military and naval, who had fallen in action under the Italian colours from 1848 to 1896. The King and Queen were present, accompanied by the ladies of honour and the officers attached to the royal person, by the Prime Minister (General Pelloux) and members of the Government and both Houses of Parliament, and by a large attendance of the academic and clinical professoriate as well as consultants, general practitioners, and leading citizens. The tablet, designed by the sculptor Tripisciano, is very simple but artistically effective, presenting in bas-relief an altar on which the figure of Italy lays a laurel branch, while a guardian angel bearing aloft a palm of victory and leaning on a lion which holds Italy's banner in its paws, keeps watch over the altar consecrated to the fallen. The tablet, surmounted by an eagle supporting the subalpine arms in its claws, has the following inscription in golden letters: "To commemorate the medical officers who fell in the campaigns of the Crimea, of Italy, and of Africa." Then come in chronological series the officers' names. The veil having been withdrawn Major-General Givogre of the army medical staff, who is also director of the hospital, in a few well-chosen words detailed the circumstances in which the gallant officers had met their death, and he was followed by Dr. Paolo Postemski, professor of pathology and clinical surgery at the Sapienza, who, speaking in the name of the Red Cross, made touching allusion to those of the organisation who had fallen, two of them having been favourite pupils of his own. Colonel Chiaiso of the medical staff and Colonel Ferrero di Cavallerleone of the combatant army spoke eloquently for their respective branches of the service, after which their Majesties, having warmly congratulated the sculptor and having cordially received those relatives of the fallen who were in attendance, went round the hospital, pausing repeatedly at the bedsides and addressing consolatory words to the patients. The whole ceremony, which was highly successful, forms the closing chapter of a story of professional skill, courage, and devotion to duty in the highest degree honourable to Italy—a story which (for the African campaign at least) has been brilliantly told by the army surgeon, Colonel Panara, in his book "Sulla Operosità del Corpo Sanitario Italiano durante la Campagna d'Africa (1896)."

Professor Robert Koch in Italy.

In May next Professor Koch, *en route* through Turin to the scene of his studies in malaria, will repair to Salsomaggiore to investigate the treatment of tuberculosis with inhalations from its richly iodised hot springs as an adjunct to his own lymph. Turin is preparing to give the illustrious bacteriologist a festive greeting and is already organising a committee for the purpose of which the president is the Senator Dr. Edoardo Maragliano, professor of clinical medicine in the Genoese school, and himself a distinguished worker in the serotherapy of tuberculosis.

March 18th.

NEW YORK.

(FROM OUR OWN CORRESPONDENT.)

Report of the State Board of Charities of New York State.

THE thirty-third annual report of the State Board of Charities has recently been made to the New York State Legislature. Fully 100 Bills affecting directly or indirectly the charities of the State were introduced during the four months of the legislative session. The most important of those passed was undoubtedly the law as to dispensaries. In 1897 and again in 1898 unsuccessful attempts were made by a number of medical societies to obtain the adoption of a measure so governing the operation of dispensaries as to restrict free treatment at these charities to the poor. The Dispensary Act which has now become law will in all respects fulfil this object. The Board reports the number and classification of beneficiaries in institutions subject to its supervision October, 1899, to be as follows: aged and friendless persons, 7392; inmates of almshouse institutions, 11,251; blind in almshouses, 341; blind in other institutions, 414; deaf in almshouses, 94; deaf in other institutions, 1548; dependent children, 31,218; disabled soldiers and sailors, 1611; epileptics in almshouses, 316; epileptics in Craig Colony, 378; hospital patients, 8223; idiotic and feeble-minded in almshouses, 1153; idiotic and feeble-minded in State institutions, 1303; juvenile offenders, 3501; inmates of reformatories, 1868; making a total of 70,611. During the fiscal year ending Sept. 30th, 1899, the total number of State poor provided for was 2135 as against 1913 during the previous year. During the fiscal year ending Sept. 30th, 1899, 88 alien poor who had been found in almshouses, asylums, hospitals, and other charitable institutions in New York State were removed to their homes in different countries of Europe. The total number of Indian poor provided for in almshouses during the year was 15. The Board report very favourably on the plan which was introduced during the past year of placing destitute infants as far as possible with private families rather than massing them together in one large institution. The death-rate in the infants' asylum at Randall's Island was in 1898 96 per cent., in 1899 the mortality was considerably lower, but the fact has been over and over again conclusively proved that the more humane method of rearing children is to keep them apart.

Uniformity in the Standard of Medical Education in the United States.

The lack of uniformity in the standard of medical education in the various States of the American Union is becoming a matter of such grave importance that at length it appears as if really serious efforts will be put forth to place the laws regulating medical practice on a proper basis. Movements have been set on foot in Michigan and New Jersey with this object in view and there are signs that other States will follow suit. Of course, the question of inter-State reciprocity cannot be considered until the standards of academic and medical education shall be substantially the same in all States. So long as this uniformity is not attained in the different States just so long will general reciprocity be impossible. It is hoped that the problem may be solved at the meeting of the National Confederation of State Examining and Licensing Boards which will take place at Atlantic city in July. This body is composed of the representatives of the examining boards of the different States, and any decision which might be arrived at by its members would be final. At any rate, the present anomalous state of affairs with regard to the laws ruling medical practice in the United States has become almost unbearable, and the fact is evident that remedial measures must ere long be taken. In connexion with inter-State reciprocity, some disgruntled medical men who were desirous to practise in New York State but who objected to undergo the test examination required by that State before being permitted to do so raised recently a rather nice point in constitutional law. These gentlemen contended that no State had the right to insist upon a further examination from men who already held a regular degree in medicine obtained in another State. Their argument was that such a proceeding was constitutionally illegal and at variance with certain sections of the Constitution of the United States, and especially of one section which says: "The citizens of each State shall be entitled to all privileges and immunities of citizens in the several States." It has, however, been shown that this belief is founded upon a misconception of the powers of the individual States to make laws. When the Union was formed the States composing it by no means gave up their sovereign powers but retained many of them, among which was the right to make police laws, including the laws regulating the practice of medicine. It would, indeed, be in a high degree unfair to the men who have taken their degrees in medicine in New York State (where a high standard of medical education is insisted upon) if graduates in medicine from other States (in some of which an extremely low standard is required) were allowed to compete with them on equal terms. Nevertheless, the fact has been clearly proved that general uniformity in medical education throughout the United States is badly needed.

Wards for the Insane in General Hospitals.

In 1889 an Act termed the "State Care Act" was passed by the New York Legislature the provisions of which enacted that the State of New York should assume the charge of all pauper patients legally adjudged insane and that the State should be divided into 11 districts, in each of which a hospital is situated for the treatment of the patients living in the locality. This arrangement has now been in working order for several years and has on the whole fulfilled its object admirably, but in the plan there remains one serious defect. When the patient has been declared insane and awaits removal to the State hospital no statutory requirement exists as to management in the interval. In New York county, King's county, and Erie county "detention" or "reception" buildings have been provided in connexion with existing hospitals, but in the rest of the State the insane person is either cared for by friends or placed in gaol. As may be imagined this method of treatment is not conducive to the recovery of the patient but, on the contrary, has had in many instances results disastrous to life. Bellevue Hospital, New York city, was the first to establish reception wards for the insane and the experience gained there has been at once instructive and most satisfactory. The improvement effected in the case of many patients has been so marked that subsequent transfer has been found to be unnecessary. Albany has now decided to follow this example, or rather to improve upon it, and a special pavilion for the insane is to be erected in connexion with the general hospital in that city. The *Albany Medical Annals*, referring to the matter, says: "It is anticipated that cases of acute delirium, alcoholic or otherwise, may be by these means protected from dangerous delays and neglect, that doubtful cases may be observed during consideration of the proper disposition to be made, and that commitments may be carefully and judiciously considered to the advantage both of the patient and the State institution to which he may be sent." The outcome of the Albany experiment will be watched with great interest throughout the United States. It is the opinion of many noted American alienists that the treatment of acute cases of insanity has up to the present been conducted upon an erroneous system and that for such cases special hospitals or special pavilions in connexion with general hospitals should be established.

A Proposed Leper Colony.

Dr. A. S. Ashmead, the well-known leprologist, recommends the establishment of a leper colony in the United States. Dr. Ashmead declares that the United States is the dumping-ground for the lepers of the whole earth and says that the condition of the laws of the country is an encouragement to lepers to come from everywhere. It is said that Dr. Ashmead has drafted a law which is to be submitted to Congress and which is intended to protect the United States from lepers. The said law provides for a commission on leprosy, to be selected by the President and to hold office for five years, and for a tract of land of 640 acres to be set aside as a national leper home in Yellowstone Park or elsewhere at a distance from the coast. The Bill also provides for an appropriation of $50,000 (£10,000) for buildings and makes it unlawful for any board of health to permit a leper to remain in their jurisdiction except in isolation. Indigent or helpless lepers are to be committed to this home. The Bill furthermore provides that it shall be unlawful for any steamship or railroad company to bring to the United States any leper or accept any emigrant from a country where leprosy is common without a special certificate from the Government Board of Health of that country countersigned by the United States consul and a

United States Marine Hospital surgeon attached to the consulate at the port of embarkation. The United States Marine Hospital Service is to have charge of the leper home. Dr. Ashmead is one of that large band of leprologists who firmly believe in the contagiousness of leprosy, and consequently he is in favour of total isolation. That isolation is the best means of treating this loathsome disease will probably be the opinion of even those who do not take extreme views as to its contagiousness. It is undoubtedly true that there are a number of lepers at large in the United States—in fact, it has been recently asserted that there are 100 lepers in New York city. Therefore a Bill such as is proposed by Dr. Ashmead would be to the benefit of the general public. The suggestion has been made recently that the lepers in the United States should be shipped to Honolulu and placed in the leper colony there.

March 14th.

AUSTRALIA.

(FROM OUR OWN CORRESPONDENT.)

Australasian Association for the Advancement of Science.

THE meeting of the Australasian Association for the Advancement of Science was held this year in Melbourne under the presidency of Mr. R. L. J. Ellery, F.R.S., C.M.G., late Government Astronomer. In the section for Sanitary Science and Hygiene some interesting papers were read. Dr. W. W. R. Love of Brisbane was to have presided over the section and given an address, but at the last moment was unable to attend, and at very short notice Dr. J. Jamieson, health officer of the city of Melbourne, took his place, and dealt in an able manner with the three diseases always present in Melbourne—typhoid fever, tuberculosis, and diphtheria. He said that typhoid fever had long been unduly prevalent in Victoria, and particularly in Melbourne. There was some reason, if not full excuse, for this condition of affairs, at least as regards Melbourne, in the fact that the metropolis of the colony had grown rapidly into a populous city, spread over a large area, with such fouling of the soil as must inevitably result where drainage facilities were defective. It was only about ten years ago since a comprehensive scheme for the drainage of Melbourne was planned, and even now only a small proportion of the houses had been connected with the sewers. He had always held that this foulness of the soil had much to do with the persistent prevalence of this typically filth disease. There was good reason to believe that the prevalence of typhoid fever in Adelaide and Sydney had been greatly reduced by the extension of drainage operations and the consequent purification of the soil around dwellings. He had noticed that the periodicity of prevalence of typhoid fever in Melbourne was apparently about every four years, but could find no satisfactory hypothesis to account for it. Though time alone could supply further evidence the experience of other parts of the world justified the confident hope that before many more years had elapsed typhoid fever as a cause of death would stand constantly at or below the lowest level which it had hitherto occasionally reached. In this colony, as also in Great Britain, tuberculosis caused about twice as many deaths year by year as all the well-known epidemic diseases taken together. It was now clear from the results of observation and experiment that unhealthy surroundings and contagion were the real causes of the occurrence of the disease in most cases, although it could not be said that heredity counted for nothing in calculating the liability to the disease. The firm assurance had been reached that tuberculosis in all its forms was a preventable disease and also that in a large proportion of cases it was curable if proper treatment was instituted. With regard to diphtheria evidence satisfactory to the vast majority of observers had been supplied that by the injection of the antitoxin many cases could be brought to recovery which would otherwise have proved fatal.—Dr. S. S. Argyle contributed a paper on the Milk-supply of Melbourne, which he characterised as one of the worst in the world. Practically all the supply was derived from 1510 dairymen who all delivered the milk by the open can method and without protection from the sun or street dust. The dairy farms were within a radius of 30 miles, and the milk from these was at least 12 hours old before it reached the consumer, and in some cases milk unsold on Wednesday afternoon was kept on ice till the following Sunday. He estimated that 500 infant lives per annum could be saved if the milk-supply was satisfactory. Municipal inspection of drains was infrequent and perfunctory and the railway arrangements for carrying and storing milk were grossly unsuitable. Dr. Argyle gave results of bacteriological investigations demonstrating the extraordinary growth of pathogenic organisms in milk under the local conditions. He advocated the system of milk-supply adopted in Copenhagen.—Dr. M. Crivelli read a paper on Alcoholism, distinguishing between the alcoholic who gradually saturated all his tissues without getting drunk and the dipsomaniac who had intermittent bouts of drinking. Both, however, were degenerates, the victims of cerebral disease. Dr. Crivelli maintained that every dipsomaniac was neurasthenic, and chiefly so by heredity. As regards treatment, reliance was placed on two remedies, in addition to special regimen. These were large doses of strychnine, hypodermically injected, and injections of ordinary blood serum—a special serum from an alcoholised animal being no more beneficial than that from any other animal or than artificial serum consisting of a sterilised solution of chloride phosphate and sulphate of sodium, which Dr. Crivelli had used with success.

Mr. A. M. Henderson, M.C.E., read a paper entitled a Comparison of the Drainage Details of Melbourne, Sydney, and Adelaide, in which he criticised adversely some of the details of the Melbourne scheme, especially the arrangements for drain-traps for cellars and the cost of the inside plumbing work and ventilation. "The system followed throughout the three colonies was the English one, under which the air of the drain was kept outside the buildings by disconnected traps, except in the case of closets. We might expect that a cheaper class of inside plumbing and less ventilation would be safe with that system but it appeared that we would have the extra cost of American plumbing added to the cost of English disconnexion." Under the arrangements for cellars by a recent notice of the Board of Works subsoil drainage will be practically stopped and one of the main objects of the great expenditure in deep drainage frustrated. Previous to this notice traps with reflux valves and in some cases silt-traps have been allowed, as in Sydney and Adelaide.

In the section of Mental Science and Education the President, Dr. W. L. Cleland, superintendent of the Parkside Lunatic Asylum, Adelaide, gave an address on the Anatomy of Mind as Bearing on Education. He emphasised the connexion between mental science and a teacher's qualifications. He would allow no one to enter the teaching profession who was ignorant of what was known anatomically, physiologically, and philosophically respecting a child's mind. The brain was not, he said, one uniform whole, but must be looked upon as consisting of a number of specialised organs or structures. Dr. Cleland then proceeded to describe in detail the action of these specialised organs and their relation to the rest of the child's anatomy. Dealing with the effects of fatigue, he urged that all attempts at teaching should at once be discontinued upon a child showing any of the signs of mental fatigue or exhaustion. If the period of rest for cell recuperation was curtailed an irritable condition was set up, as a result of malnutrition, which might become habitual. Dividing the period of a child's development into three divisions Dr. Cleland would have the education in the first, the pre-school division, devoted to the cultivation of the articulate capacity, to connecting names with various objects, and to stimulating observation of surrounding persons and things. In the second division he would allow the introduction of education in the more technical sense. The characteristic attitude of the teacher at this stage would be one of dogmatic insistence. In the third division the child was supposed to have passed to the age of reason, and the teacher to assume the role of guide, philosopher, and friend. Dogmatism would be now out of place and appeals could be made to abstract propositions and generalisations. Dr. Cleland's conclusions were, if education was to be conducted on the lines of brain growth and with due regard to developing anatomy: (1) the necessity for an abundance of nutriment out of which to elaborate nerve force; (2) the necessity that there should be a cultivation suited to each period of growth; and (3) the necessity for a study of the individual potentialities of each pupil, so as not to expect the unattainable in one case or repress the possibilities in another.

In the same section a paper was read by Dr. R. R. Stawell on the problem of the State Education of Children

Physically Afflicted or Mentally Impaired. After briefly sketching the history of the movement for the State education of the blind, deaf, and otherwise defective children in England and elsewhere, he pointed out that there was a class of feeble-minded children as distinguished from imbeciles or idiots. The former might be trained so as to become serviceable citizens; the latter could only be made as happy as possible under the sad conditions of their lives. The physical conditions of feeble-mindedness needed more exact investigation. All scholars below or above the average should be examined by an expert. It was estimated that 1 per cent. of the children of the school-going age were feeble-minded and needed special provision. In Victoria 188,359 children between six and 13 years of age were enrolled in schools, about 10,000 being unaccounted for. There were probably 2000 children, therefore, in Victoria who needed special educational assistance and who were at present totally neglected. A conference should be held between inspectors of schools and medical experts to determine a standard and methods of examination and there should be a house-to-house census of children of school age. The system of instruction should be such as had proved effective in the case of imbeciles and a competent instructor should be imported from England. The teachers' training should include general kindergarten methods, physiology and school hygiene, gymnastics on some rational method, voice production and articulation, "Sloyd" and other manual work, and some months' practical instruction. Special classes could be formed at once within the metropolitan area with advantage on the lines recommended by the late British Royal Commission and homes should be opened for the reception of such children in the neighbourhood of the classes.

Criminology from a Medical Standpoint was treated by Dr. J. V. M'Creery, medical superintendent of the Kew Asylum, in a thoughtful paper in which he pointed out that much difficulty and confusion were caused by the present practice of trying to force all persons accused of crime into one of two groups—to make them either fully responsible or quite irresponsible for their actions. Such a division did not naturally exist and any real reform must be based on a more perfect classification. Much of the conflict of medical evidence now so often heard in their courts when the question of insanity arose was due to the confounding of insanity and responsibility and the arbitrary line drawn between this latter and total irresponsibility. The non-natural view of insanity generally taken by the legal mind was not favourable to the full and calm consideration of the causes which led to crime being committed. The difficulties were increased by the method of each side calling its own expert witnesses, and as the object of the lawyer was to make out the best case possible for his own side the medical witnesses were often forced into a wrong position and to take opposite standpoints even when no fundamental difference existed between them. Persons found not guilty on the ground of insanity were detained in a gaol or asylum at his Excellency's pleasure, and under the old restricted view of criminal insanity little or no inconvenience was caused by this arrangement. But this term was ever growing wider and some more definite system of dealing with these unfortunates seemed needed. Some of these cases were sane at the time of the trial; others became so afterwards. Naturally efforts were made to procure the discharge of persons whom the law did not hold responsible for their acts and who afterwards became sane. Not only, however, might there be danger to the community in permitting such persons to be at large, but there appeared to be a growing tendency for criminals to hope for a lenient view being taken of their deeds by shielding themselves behind the plea of insanity. There could be, he believed, no hard-and-fast rule in dealing with criminals. Each case required careful study and such methods of treatment as might best promise improvement to the individual and safety to the community. To do this the matter must be dealt with by the combined wisdom of the lawyer and the medical man and the common sense of the laymen. The present system did not reform many criminals or in any satisfactory manner protect society. Until they faced and grappled with the real facts of the causes of crime little advance could be expected.

In the section of Economics Mr. A. O. Powys of St. Kilda read a mathematical paper which dealt with the Annual Probability of Death from Cancer at Every Age of Male and Female Life in New South Wales, Victoria, England and Wales, and Scotland. The "crude probabilities" derived from the annual number of deaths and the population according to ages were adjusted upon Professor Karl Pearson's theory of skew curves. The equations to such curves were given, together with the ages of greatest probability and the intensity. Thus, amongst males in Victoria in 1881 the maximum death-rate was 3·93 per 1000 at the age of 76 years, whilst in 1895 the maximum was 6·43 per 1000 at the age of 77 years. Amongst females the corresponding values were 3·80 at the age of 70 years and 6·12 at the age of 74 years respectively. The death-rate, said Mr. Powys, did not afford a true gauge of the ravages of cancer unless between communities of like "age constitution," as the death-rate from cancer was very small at ages under 35 or 40 years. After placing the several communities upon the same basis as regards age constitution it was found that cancer was more fatal in Scotland—an essentially non-meat-eating community—than in the Australian colonies, where the inhabitants are essentially meat-eaters. This should prove that increased meat-eating was not responsible for the increase in the cancer death-rate. Mr. Powys agreed with the view of Dr. Woods Hutchinson that some part of the increase of cancer was due to the fact that, "to use a Hibernicism, more people are living long enough to die of it." Using the adjusted cancer death-rates in conjunction with a life table it appeared that in Great Britain one out of every 22 males born dies ultimately from cancer, and of those who survive to the age of 40 years one in every 14. In Australia one out of every 19 males born, and one out of every 13½ who survive to the age of 40 years, so die.

Obituary.

JOHN CADWALADR WILLIAMS, M.B., C.M. EDIN., M.R.C.S. ENG., L.R.C.P. LOND.

THE death is recorded at the early age of 31 years of Dr. John Cadwaladr Williams of Grange-road West, Middlesboro', which took place at his home, Brynymor, Penygroes, Carnarvonshire, on March 12th. The sudden death of his father, the Rev. J. J. Williams, on March 1st had brought him home and being in indifferent health he contracted a chill at the funeral which resulted in pneumonia. Dr. Williams was educated at Edinburgh University and the Royal College of Surgeons of Edinburgh, gaining the silver medal in anatomy and holding the post of demonstrator of anatomy at the latter school. He took the degrees of M.B. and C.M. Edin. in 1891. Subsequently he became a ship surgeon and on his return he continued his studies at Guy's Hospital, London, and took the M.R.C.S. Eng. and L.R.C.P. Lond. in 1897. Shortly afterwards he settled down in Middlesboro' as partner with Dr. W. J. Williams, Grange-road West, where he rapidly gained the confidence of his patients and by his kind, thoroughly upright, and honourable disposition formed a large circle of friends who mourn his loss. He also held the office of public vaccinator for the Middlesboro' district.

ALLAN McLEAN, M.D., C.M., L.R.C.S., L.M. EDIN., J.P.,

LIEUTENANT-COLONEL COMMANDING 1ST DORSET VOLUNTEER ARTILLERY.

THE death is announced at his residence in Weymouth of Lieutenant-Colonel McLean, M.D. Edin., the commanding officer of the 1st Dorset Volunteer Artillery. The deceased, who received his medical education at Edinburgh University, graduated M.B. and C.M. in 1868 and in the same year took the qualifications of L.R.C.S. and L.M. Edin. He was admitted to the M.D. degree in 1889. Dr. McLean was one of the leading practitioners in Dorset, being formerly medical officer of health of the Isle of Portland and for 19 years physician to the Royal Portland Dispensary. In 1864 the deceased received a commission in the Edinburgh University Rifles and since then had taken a very keen interest in the volunteer movement. In 1885 he succeeded Colonel Elliott as commanding officer of the 1st Dorset Volunteer Artillery, and the present efficiency of the corps is largely due to Dr. McLean's efforts. The deceased was a Justice of the Peace for the county of Dorset and an energetic Freemason, well known in the province of Dorset. Dr. McLean had lately been in failing health, but his death came somewhat suddenly.

Medical News.

FOREIGN UNIVERSITY INTELLIGENCE.—*Cracow:* Dr. S. Ciechanowski has been appointed Extraordinary Professor of Pathological Anatomy.—*Bologna:* Dr. Cervesato of Padua has been appointed Professor of Children's Diseases.—*Genoa:* Dr. Rudolf Weber has been appointed to the chair of Mental Diseases in succession to Dr. J. Martini, resigned.—*Jassy:* Dr. C. Juvara has been appointed Professor of Surgical Anatomy.—*Leipsic:* Dr. Felix Marchand of Marburg has been appointed to the chair of Pathological Anatomy in succession to the late Dr. Birch-Hirschfeld.—*Marburg:* Dr. Hugo Ribbert of Zürich has been appointed to the chair of Pathological Anatomy in succession to Professor F. Marchand who goes to Leipsic. He is the author of a manual of pathological histology and a work on the historical development of the theory of disease.—*New York Polyclinic and Hospital:* Dr. R. O. Born has been appointed Professor of Ophthalmology.—*St. Petersburg:* Dr. Skorichenko has been promoted to the ordinary Professorship of the History of Medicine and Dr. Kholodovski to the ordinary Professorship of Comparative Anatomy. Dr. Magawly, Director of the University Ophthalmic Clinic, who was a pupil of Albrecht von Graefe and assisted in introducing modern ophthalmic surgery into Russia, is about to retire.—*Turin:* Dr. A. Carle has been promoted to the ordinary Professorship of Surgical Pathology.

PRUDENTIAL ASSURANCE COMPANY, LIMITED.—The continuous prosperity of this long-established company is clearly shown by the recently published accounts and balance-sheets for 1899. In the ordinary branch the number of policies issued during the year was 65,470, assuring the sum of £6,355,850 and producing a new annual premium income of £352,003. The premiums received during the year were £3,144,464, being an increase of £176,963 over the year 1898. The claims of the year amounted to £1,225,906. The number of deaths was 5899 and 3963 endowment assurances matured. The number of policies in force at the end of the year was 570,414. In the industrial branch the premiums received during the year were £5,168,958, being an increase of £208,202. The claims of the year amounted to £2,059,340. The number of deaths was 209,807 and 2239 endowment assurances matured. The number of free policies granted during the year to those policy-holders of five years' standing who desired to discontinue their payments was 72,611, the number in force being 663,250. The number of free policies which became claims during the year was 14,533. The total number of policies in force at the end of the year was 13,433,785; their average duration exceeded 8¾ years. The assets of the company in both branches were £36,832,059, being an increase of £3,232,351 over those of 1898.

ECZEMA AT THE LEICESTER COTTAGE HOMES.—Since the opening of the Leicester Cottage Homes in 1884 there have been many cases of eczema of varying degrees of severity and, in accordance with the request of the Local Government Board, the guardians instructed the medical officer of the homes (Mr. Richard Steele) to make a report as to the water-supply as it affected the health of the children. In his report Mr. Steele said the children at the homes as a rule were admitted very young and had a healthy look considering the nature of their bringing up and of the surroundings from which they came. Some of those who had never suffered previously from any skin affection developed, soon after admission, a certain degree of eczema in various parts of the body, particularly the scalp. He was strongly of opinion that the hardness of the drinking-water was largely answerable for the condition of eczema which was too prevalent there. At a meeting recently held the guardians reported that on the receipt of this report they forwarded samples of water drawn from three of the wells to Mr. S. F. Burford, analyst. The latter reported that the water from one well was badly polluted with animal organic matter and was unfit for drinking or domestic use, showing in addition to other foreign matter 77 grains of solid matter per gallon, 6·09 grains of chlorine, and 2·08 grains of nitrogen as nitrates. The water from another well was even worse, the water being slightly turbid and containing per gallon 9·49 grains of chlorine, 179·9 grains of solid matter, and 118 degrees of hardness; ammonia was also present. It was not fit for drinking or for domestic purposes. Having regard to these unsatisfactory reports the board decided to seek for other sources of water-supply.

BRISTOL MEDICAL DRAMATIC CLUB.—The Bristol Medical Dramatic Club will give a performance of J. M. Barrie's comedy *The Professor's Love Story* at the All Saints' Hall, Clifton, on April 24th, 25th, 26th, 27th, and 28th, at 8 P.M., in aid of the funds of the Royal Infirmary and General Hospital.

APPOINTMENT OF A MEDICAL OFFICER OF HEALTH.—At the meeting of the St. Austell (Cornwall) Urban District Council held on March 13th, after a considerable discussion, Mr. William Mason, L.R.C.P. & S. Edin., was appointed medical officer of health for life, an amendment to make the appointment for three years only being defeated by seven votes to four.

VACCINATION PROSECUTIONS.—A number of vaccination defaulters were summoned at Frome (Somerset) on March 15th. Mr. Schultess Young, who defended, took the objection that the guardians must direct prosecutions under Section 29 of the Act and that the wrong section had been taken. After an argument the bench of magistrates dismissed all the cases.

WESTERN COUNTIES VETERINARY MEDICAL ASSOCIATION.—The annual meeting of this association was held at Exeter on March 15th under the presidency of Mr. Penhall. Professor Stewart Stockman of the Royal Dick College, Edinburgh, read an interesting paper on the Method of Infection in Black Quarter, after which a discussion followed. Mr. Bond of Plymouth was elected president for the ensuing year.

LUNACY IN DORSETSHIRE.—At the annual meeting of the Dorset County Council held at Dorchester on March 13th under the presidency of Lord Dorchester it was reported by the Asylums Committee that 1899 had been the most prosperous year on record as regarded profits from out-county and private patients and £2000 had been handed over to the county exchequer. The number of pauper patients for the first time for some years showed a decrease.

BRISTOL MEDICAL MISSIONARY SOCIETY.—The twenty-eighth annual meeting of this society was held on March 13th under the presidency of Mr. J. Storrs Fry. The honorary secretary stated that 7535 patients had been under treatment during 1899; their attendances numbered 22,587. 1833 patients had been attended at their homes. The financial report showed that the adverse balance of 1898 had been slightly reduced by a legacy received, but the expenditure exceeded the income from subscriptions and donations.

LITERARY INTELLIGENCE.—The following books are in the press and will be published by Messrs. J. and A. Churchill at an early date:—"The Clinical Examination of Urine, with an Atlas of Urinary Deposits," including 41 original plates (mostly coloured), by Dr. Lindley Scott; "A Treatise on Diseases of the Ear," second edition, by Mr. Mark Hovell, aural surgeon to the London Hospital; new editions of Dr. Tom Robinson's books entitled, "The Diagnosis and Treatment of Syphilis" and "On Eczema"; the third edition of Clowes' and Coleman's "Elementary Practical Chemistry"; and "Chemistry, An Exact Mechanical Philosophy," by Fred. G. Edwards, inventor of atomic models.

BRISTOL GENERAL HOSPITAL.—The annual meeting of governors and friends of this institution was held on March 12th under the presidency of Mr. W. Proctor Baker. The medical report stated that 2023 in-patients had been admitted during 1899, against 1393 in the previous year; the out-patients numbered 29,287, against 27,876 in 1898. The financial report showed that if it had not been for utilised legacies there would have been a deficit of £2300. The workpeople's contributions amounted to £2041. The ordinary finances showed an increase over 1898, but this was accounted for by the larger amount of donations, including £1000 from Sir G. Edwards and a similar sum from an anonymous donor. It was stated that the following scholarships had been awarded: Clarke surgical scholarship of £15 to Mr. R. G. Johnson; Sanders scholarship of £22 10*s.* to Mr. R. G. Johnson; Lady Haberfield prize of £29 9*s.* 8*d.* to Mr. L. W. Morris; Martyn memorial scholarships—£10 to Mr. T. Aubrey and £5 each to Mr. R. G. Johnson and Mr. L. A. Moore.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

The Accounts of the General Medical Council.

On March 16th returns of receipts and expenditure of the General Medical Council and of the Branch Councils for England, Scotland, and Ireland, also receipts and expenditure of the Dental Registration Fund for the year 1899 were laid on the table of the House of Lords.

The Midwives Bill.

The consideration of the Midwives Bill by the Standing Committee on Law begins to-day, Friday (March 23rd). Another step in the progress of the measure was marked on Wednesday, March 21st, when notice was given of a motion to authorise the payment out of moneys to be provided by Parliament of such expenses as the General Medical Council may incur in the administration of the proposed legislation. A motion of this kind is necessary in connexion with all Bills which involve additional financial burdens. It is dealt with in committee of the whole House.

HOUSE OF COMMONS.

THURSDAY, MARCH 15TH.

The Sanitary Condition of Malta.

Mr. STEVENSON asked the Secretary of State for the Colonies whether he could now state the decision of Her Majesty's Government with regard to the advisability of holding a departmental or inter-departmental inquiry into the sanitary condition of the barracks, hospitals, and burial grounds at Malta with the object of improving the buildings occupied by the army and by naval officers and others in that island.—Mr. CHAMBERLAIN replied: The consideration of this subject has not yet been concluded, but as at present advised Her Majesty's Government do not perceive that any departmental inquiry will be required.

The Food of the Channel Fleet.

Mr. MACNEILL asked the First Lord of the Admiralty (1) whether he was aware that there was discontent among the crews of the Channel Fleet with respect to the quality and quantity of the food supplied to the ships, and that complaints with reference to the quality and quantity of the food were discountenanced by the officers and regarded as evidence of insubordination; and (2) whether he would direct an investigation independently conducted to be made as to whether the rations served on board Her Majesty's ships of the Channel Fleet were of the proper quality and quantity, and whether the Admiralty would direct the sale of provisions on board these ships to be discontinued, or provide that goods be sold at the canteens not at extortionate prices but at the prices at which similar goods were sold on shore.—Mr. MACARTNEY replied to the question saying: The answer to the first question is in the negative. With regard to the second question I must refer the hon. member to the remarks made by me in the course of the debate in this House on Thursday last. The Managing Committee, which with two exceptions is composed of representatives of the men, should be competent to take precautions against extortionate prices being charged. As a matter of fact, it is understood that the goods sold in the canteens are retailed at a lower price than that at which they could be obtained by the men on shore.

The Wounded who have Returned to the Front.

Mr. WINGFIELD-DIGBY asked the Under-Secretary of Sate for War whether he would give the actual or approximate number of those who had been returned wounded since the commencement of the war who were already cured of their wounds and back again at the front.—Mr. WYNDHAM: I can give the figures up to Feb. 2nd, which are as follows:—Wounded: officers, 281; non-commissioned officers and men, 4583. Returned to duty: officers, 67; non-commissioned officers and men, 705. These figures do not include casualties in Ladysmith and Kimberley since investment.

Dogs Regulation Bill.

Mr. WALTER LONG, President of the Board of Agriculture, introduced a Bill to amend the law relating to dogs. He explained that, the muzzling order having done its duty, there was now room for a more moderate measure, and this Bill would clear up doubts as to the law and enable local authorities to make by-laws.

Petroleum Bill.

A Bill was introduced by Mr. URE to raise the statutory flash-point of petroleum oil. Mr. Ure served on the Select Committee which inquired into the petroleum question and he introduced a Bill on the subject last session.

FRIDAY, MARCH 16TH.

Milk Prosecutions.

General LAURIE asked the President of the Local Government Board whether his attention had been called to the report of the public analyst to the Vestry of Paddington for the quarter ending Dec. 25th, 1899, wherein it appeared that the magistrate at the Marylebone Police Court, in the case of a sample of butter containing 65 per cent. of margarine, imposed no fine but only costs of 12*s.* 6*d.*, and gave the same decision in another case where the sample contained 80 per cent. of margarine, and in another case where the so-called butter was entirely margarine imposed a fine of 10*s.* and 12*s.* 6*d.* costs; also in two other cases where a farmer had sent to the railway-station two churns of milk from which half the cream was deficient the summons was dismissed on the explanation that the milk from which these samples was taken was received at the farm dairy on the evening of each day, mixed in a large container, and left for the night, and that next day the churns were filled for transmission to London by means of a tap at the bottom of the container, no previous stirring up of the contents of the container taking place; whether it would be possible to issue a circular or otherwise to instruct magistrates having jurisdiction in such cases that when milk was left undisturbed the cream rose to the top, and hence the lower part of the milk did not contain its share of cream, which it should be considered had been removed from it, and that such milk was to be dealt with as adulterated; whether his attention had been further called to the fact that practically the same percentage of milk purchased at railway stations was adulterated as of milk purchased in town, thus showing it was not the retailer who was alone to blame; and whether it was possible in any way to assist local authorities who were doing all in their power and expending large amounts of money in endeavouring to carry out the law so as to protect the humbler consumers and who thus found their efforts discouraged.—Mr. WALTER LONG, President of the Board of Agriculture, replied, saying: I have seen the report to which my hon. and gallant friend refers, but the information at present at our disposal would scarcely justify the adoption of the course suggested. Our inspectors are, however, closely watching the administration of the Acts, in consultation with the local authorities concerned, and the representations of my hon. and gallant friend will be kept in view. I could not take upon myself to express an opinion as to the respective culpability of producers and retailers of milk so far as adulteration is concerned.

Death Certification.

Sir WALTER FOSTER asked the President of the Local Government Board whether his attention had been called to the frequency of complaints in coroners' courts respecting the signature and filling up of death certificates; and whether he would bring in a Bill to amend the law of death certification, as recommended by the Select Committee of 1893.—Mr. T. W. RUSSELL, on behalf of Mr. Chaplin, said: I am aware that complaints have been made of the kind referred to. The question is being considered, but I am afraid I cannot give the undertaking asked for by the hon. Member to bring in a Bill during this session.

Army Rejections for Bad Teeth.

Mr. WEIR asked the Under-Secretary of State for War, seeing that the First Lord of the Admiralty recently stated that fully 25 per cent. of the recruits for the navy were rejected on account of bad teeth, would he state what percentage of the recruits for the army were rejected for this cause during the year ending Dec. 31st, 1899.—Mr. WYNDHAM: The percentage was 7·74 of the total number rejected, 2·5 of the total number presenting themselves.

The Treatment of Lunatics in Scotland.

Mr. WEIR asked the Lord Advocate if his attention had been called to the recommendations contained in the forty-first annual report of the General Board of Commissioners in Lunacy for Scotland to the effect that measures should be taken to give district lunacy boards permissive powers to provide accommodation for the poorer class of private patient and would he say what action it was proposed to take in the matter.—The LORD ADVOCATE replied: The answer to the first paragraph of the question is in the affirmative. The Secretary for Scotland does not propose to take any action at present.

The Vote for the Army Medical Establishment.

The House in Committee of Supply on the Army Estimates discussed at length the vote of £555,000 for the medical establishment and for medicines, &c., for the year to March 31st, 1901.

Dr. FARQUHARSON spoke of the conspicuous success of the Army Medical Department in South Africa. He thought he might put it as high as to say that this department had been the real success of the war. The more they heard of what was going on at the front the more they were filled with admiration for the pluck, devotion, and skill which had been displayed and the hard work which had been carried out by the officers of the Army Medical Department. The Mauser bullet was a humane missile and where it gave a fatal wound was a swift mode of taking life. But he could not speak in too severe terms of condemnation of the Boers for using soft-nosed bullets, the wounds from which, if he were to give details, would simply appal the Committee. Sand and pebbles and every kind of external abomination were found in the wounds where they had been caused by this description of bullet. The hospital accommodation and nursing had both been excellent. It had been found that the new system under which distinct and definite military rank was given to the medical officers had worked admirably, and he hoped to hear that the medical schools had done their best to provide a full and continuous flow of good candidates to fill up the ranks of the service. While the Government were proposing a large permanent increase to the army the increase in the number of medical officers was only six. They ought not to rely on any hand-to-mouth system of employing civilians. He did not know that they would be very much longer able to obtain a sufficient number of eligible candidates for the present somewhat meagre pittance paid to men who had to go through six years of expensive and laborious preparation.

Mr. PRICE also spoke in terms of praise with regard to the work of the Army Medical Department in South Africa and suggested that greater inducements should be offered to medical men to join the service.

Mr. ARNOLD-FOSTER asked for an explanation of the circumstance that large numbers of men on reaching South Africa had been sent to hospital.

Sir WALTER FOSTER said that many of the men sent out were suffering from chronic disease which ought to have been recognised. The number had so increased that temporary buildings for their accommodation had to be provided, the special hospital allocated for their reception having become full. The Royal Army Medical Corps had done their duty splendidly and shown great courage and devotion; but it had notoriously been weakened in numbers of recent years, and the pick of the corps having been sent to South Africa it was necessary to supplement those left at home by civilians. It might be that the errors made in passing men for the front were made by these temporary civilian substitutes. He regretted that a larger increase of the corps was not proposed. It would probably be necessary to offer an increase of pay in order to attract the best men. The War Office would have done better to spend money in this way than in lavish generosity to civilian surgeons who had gone to the front. It was perfectly right to send out Sir William MacCormac and Mr. Treves, who had rendered valuable services, but it was not necessary that everyone should be treated on the same terms as the most distinguished men in the profession. He believed that when one

of the distinguished surgeons asked for an assistant the War Office rated the assistant on an equality with his principal and paid him on the scale of £5000 a year. He also called attention to the prevalence which had been noticed, especially at Ladysmith, of typhoid fever. In the debates of last year it had been pointed out that Ladysmith was not a healthy place for a camp, that it was likely to be ravaged more or less by the prevalence of fever, and that its water-supply was not satisfactory. Those criticisms had been amply verified by the terrible experience obtained in that position. A similar condition of affairs had prevailed in various camps on the Modder river and elsewhere, and he hoped that the War Office would see that attention was paid not only to the surgical aspects of the war but to its sanitary aspects. In some respects also our ambulances had not been found to be as useful as the ambulances of our enemies who had lighter carts. He had been told by persons of experience that we had made a great mistake in having too heavy wagons. The rule which ought to be followed was to obtain the lightest possible wagon for the roughest country, but that was a rule which had not been followed in building their ambulance carts for the use of the wounded. He hoped that the debate might result in producing a greater amount of applications on the part of candidates for the Royal Army Medical Service. He thought that the last examination was not as satisfactory as it should be in the number of applicants and he hoped that the medical schools throughout the country would take this matter up. He thought that the suggested modification of the examination might be useful. These men were now carefully examined under the supervision of the General Medical Council before they could obtain diplomas and consequently they ought to have an examination in a special direction in connexion with their future duties. If this training were followed up by some experience, say, at Netley, six months before they were attached to any Army medical service the complete education necessary would be given; and if supplemented by opportunities to rub off the rust he thought a still more efficient Army Medical Corps would be produced than they had at present, while affording inducements to men entering the profession to make that efficiency the object of their ambition.

Colonel BLUNDELL recommended that for a certain period of time a medical officer should be attached to a regiment.

Mr. WASON suggested that information should be published as to the results of inoculation against typhoid fever.

Mr. GEORGE WYNDHAM, Under-Secretary of State for War, replying on behalf of the War Office, said it was true that the committee could not pay too high a tribute to the fortitude, courage, and efficiency of the medical officers which had been displayed. They were not exalted by the joy and intoxication of battle; they were sustained alone by their devotion to suffering humanity and this rendered their services in his opinion all the more heroic. The medical schools in supplying candidates had fulfilled their part of the bargain, to which the department was the other party in allocating military rank. The result had been, he hoped, satisfactory to them as it had been to the army; but the department did not reap the whole results of such a change in the first or second year. The next point raised was that the present numbers of the Royal Army Medical Corps were not adequate to the size of the Army. They might expect that the inducements which had been offered would, in the course of the next few years, give them numbers even more satisfactory than those which had been forthcoming recently. It would be impossible to keep up at all times an establishment of the Royal Army Medical Corps which would be adequate to a time when they were mobilising the whole of the Army for an expedition. Ordinarily there were 107,000 regular troops in this country, but at this moment there were, or there would be very soon, 208,000 in South Africa alone who looked to either the Royal Army Medical Corps or civilian medical men. And, besides, there were now 100,000 regular troops in this country. If the Royal Army Medical Corps were sufficient to deal with the present numbers it would have to be three times as large as would be necessary one year in 20, certainly one year in 10. Reference had been made to the great services of Sir William Mac Cormac and Mr. Treves. He was sorry that some gentlemen had insinuated that the services of the other five consulting surgeons had been too generously recognised. A surgeon of the standing which these gentlemen had achieved who went out to South Africa did not only risk his life but he made a great financial sacrifice. His income was to be told in thousands, and to leave a *clientèle* of that size in order to proceed to South Africa, with the possibility of not returning for five, six, or seven months, was really, in addition to the personal sacrifice, to make a present of £5000 or £6000, or perhaps £10,000, to the taxpayers of the country. And, therefore, he did not think that £5000 a year was a shilling too much to pay for the services that such gentlemen had rendered. They were asked to offer such inducements to the Royal Army Medical Corps as would enable them to obtain the heads of the medical profession. They hoped that gradually in respect to the Army Medical Corps, as in respect to every other branch of the service, they would be able to improve the conditions under which men served, and that, therefore, they would obtain the best material within their reach. The statement that a number of men were landed in South Africa who were at once invalided was one which deserved and would receive examination. He understood it referred exclusively to reservists and militia men. But let it not go abroad that there had been any great amount of sickness in South Africa. The percentage of sickness in this expedition had been far lower than in any case of which there was record. It might be that some civilian practitioners had not their eyes trained to the fact of certain chronic complaints which were injurious to the soldier, but he thought he had proved that when they were sending away a force of the size of that now in South Africa they must bring to their aid a great amount of civilian assistance, and it might be that the special attention usually paid had not been paid to those chronic complaints with which military officers were now acquainted in their bearing upon soldiers. It was quite true that enteric fever had been prevalent in Ladysmith, as it was usually where men were encamped for a lengthy period. But the Royal Army Medical Corps had made enormous progress in sanitary appliances during recent years. Great attention had been bestowed upon the conditions which enabled them to fight with this disease, and, taking it all round, he believed the amount of enteric fever in this campaign had been very much lower, for instance, than it was in the Soudan. That he attributed partly to the climate of South Africa and also largely to the progress made in the sanitation of camps. As to inoculation, the first experiments did not cover any great number of men, and he thought the committee would agree with him that they had done what was prudent in waiting for the experience of the campaign generally before drawing up statistics. The hon. and gallant member for the Ince Division (Colonel Blundell) had invited them to return to the system of a regiment having its own medical man. He was afraid he could not hold out any hope that even in the modified degree the hon. and gallant gentleman advocated the system could be adopted.

Sir WALTER FOSTER said he agreed with every word the Under-Secretary had said about the work of the Royal Army Medical Corps and about the aid given by the distinguished civil surgeons who had gone to South Africa. When, however, one of these distinguished surgeons had to take an assistant with him he thought it was unnecessary generosity on the part of the War Office to pay the assistant at the same rate as his chief; indeed, he considered it an abuse of the whole system. That was the point he wished to put before the Committee. He thought it was an unnecessary step to put all the surgeons on the same footing.

Dr. FARQUHARSON put forward the suggestion that officers of the Royal Army Medical Corps should have study-leave granted to them.

Mr. WYNDHAM assured the hon. Member that this matter was under consideration. On the subject of inoculation Mr. Wyndham said that the whole system was voluntary. Every soldier proceeding to South Africa was given the opportunity if he wished of being inoculated and a very large number—nearly 60 per cent. in some regiments—had availed themselves of it. The time for drawing conclusions from the experiment would be when they had the whole results before them at the end of the campaign.

MONDAY, MARCH 19TH.

Hospitals and Local Rates.

Sir CAMERON GULL asked the First Lord of the Treasury whether, having regard to the representations which had been made to Her Majesty's Government through the President of the Local Government Board, he could state if the Government would this session undertake legislation relieving hospitals in Great Britain from local rates.—Mr. BALFOUR replied: As my hon. friend is aware I have already expressed sympathy with the object which he has in view, but the question is one which is surrounded by a considerable amount of difficulty, and I think that probably the best plan would be to have a committee of this House to look into the subject.

TUESDAY, MARCH 20TH.

Medical Appointment in Dublin.

Mr. ARTHUR MOORE asked the Attorney-General for Ireland whether it was intended to institute the office of medical referee to the Registrar-General's office in Dublin and what were to be the duties and emoluments of the appointment.—The ATTORNEY-GENERAL (Mr. Atkinson) replied: It is proposed to appoint a medical man to the office of superintendent at present vacant in the Department of the Registrar-General. The salary attached to the post will be £350, rising by £15 annually to £500. The duties of the officer will be those generally of a superintendent, but particularly with regard to the preparation of vital statistics.

BOOKS, ETC., RECEIVED.

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Pratique de la Chirurgie Courante. Par Dr. M. Cornet. Preface de M. le Professeur Ollier. 1900.

ARROWSMITH, J. W., Quay-street, Bristol.

Nordrach at Home: or Hygienic Treatment of Consumption adapted to English Home Life. By J. J. S. Lucas, L.R.C.P. Lond., M.R.C.S. Price 1*s.*

BAILLIÈRE, J. B., ET FILS, Paris.

Cancer et Tuberculose: Hybridités Tuberculo-Cancereuses. Par Dr. H. Claude. 1900.

BAILLIÈRE, TINDALL, AND COX, King William-street, Strand, London.

Aids to Practical Pharmacy. By A. Campbell Stark. Price 2*s.* 6*d.*

Treatise on Orthopædic Surgery. By E. H. Bradford, M.D., and R. W. Lovett, M.D. Second edition. Illustrated. 1900. Price 18*s.* net.

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Bubonic Plague. With an Appendix. By Dr. J. V. Montenegro. Translated by W. Munro, M.D. 1900. Price 3*s.* 3*d.* net.

Diphtheria. Being the Harben Lectures, 1899. By W. R. Smith, M.D., D.Sc., F.R.S. Edin. 1900. Price 6*s.* net.

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Ueber Bäderkuren in Bad Nauheim. Von Dr. Graupner. 1900.

Die Paroxysmale Tachycardie (Anfälle von Herzjagen). Von Dr. A. Hoffmann. 1900.

Das Sarkom des Auges. Von R. P. Kerschbaumer. 1900.

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Who's Who at the War. 10th 1000. 1900. Price 6*d.* net.

BOWDEN, JAS., Henrietta-street, Covent-garden, London.

Brain and Body: the Nervous System in Social Life. By Dr. A Wilson. 1900. Price 1*s.* 6*d.*

BUTTERWORTH AND CO., 12, Bell-yard, Temple Bar, London.
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CARRÉ, G., ET C. NAUD, Paris.
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Les Sanatoria: Traitement et Prophylaxie de la Phtisie Pulmonaire. Par S. A. Knopf. 1900.

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GRIFFIN, C. AND CO., Exeter-street, Strand, London.
The Flowering Plant as Illustrating the First Principles of Botany. By T. R. A. Davis, M.F.C.P. Third Edition. Illustrated. 1900. Price 3s. 6d.

KEGAN PAUL, TRENCH, AND CO., Charing Cross-road, London.
Victor Von Richter's Organic Chemistry, or Chemistry of the Carbon Compounds. Edited by Professor R. Anschutz, assisted by Dr. G. Schroeter, and translated by E. F. Smith. Vol. ii. 1900. Price 15s.

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Physiology. By H. D. Collins, M.D., and W. H. Rockwell, jun., M.D. Series edited by S. B. Gallaudet, M.D. Illustrated. 1900.

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A Manual of Gynæcological Practice. By Dr. A. Duhrssen, Berlin. Second English edition, translated from the sixth German edition. By J. W. Taylor, F.R.C.S., and Frederick Edge, M.D. Lond., F.R.C.S. Illustrated. 1900. Price 6s.
Anæsthetics, their Uses and Administration. By Dudley W. Buxton, M.D., B.S. Third edition. 1900. Price 6s.

LIBRAIRIE MALOINE, Paris.
Mémentos de Médecine Thermale du Dr. G. Morice, avec une introduction par H. Huchard. 1900.

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The Norwegian North Polar Expedition, 1893-1896. Scientific results. Edited by F. Nansen. Vol. i. 1900. Price 40s. net.

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A Text-book of Physiology. By M. Foster, M.D., D.C.L., F.R.S., assisted by W. H. R. Rivers, M.D. Part 4, The Senses. Sixth edition. Price 10s. 6d. 1900.
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Morison's Chronicle of the Year's News of 1899. A diary and epitome compiled by Geo. Eyre-Todd (Oliphant Earl). Second year of issue. 1900. Price 3s. 6d. net.

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The Art of Feeding the Invalid. By a Medical Practitioner and a Lady Professor of Cookery. New edition.

SEITZ AND SCHAUER, München.
Die Prophylaxe bei Geschlechts- und Hautkrankheiten. Von Dr. Max Joseph, Berlin. 1900.
Die moderne Behandlung der Spondylitis. Von Professor Dr. A. Hoffa. 1900.
Die Prophylaxe in der Geburtshilfe. Von Dr. O. Schaeffer. 1900.
Weitere Beiträge zum Nervösen Asthma. Von Dr. S. Goldschmidt. 1900.

SOCIÉTÉ D'ÉDITIONS SCIENTIFIQUES, Paris.
Histoire Critique de la Chirurgie Antiseptique. Par J. Coquerelle. 1900.
Précis d'Urologie Clinique. Par L. Lematte and Dr. H. Labonne.

SPON, E. AND F. N., 125, Strand, London.
A Pocket-Book for Chemists. By Thos. Bayley, Assoc. R.C.Sc.I. Seventh edition. 1900. Price 5s.

SWAN SONNENSCHEIN AND CO., Paternoster-square, London.
A Primer of the Physiological Action of Alcohol. By E. J. Norris, L.R.C.P., M.R.C.S., with an Introduction by Dr. Clifford. Illustrated. 1900. Price 1s. net.
The Management and Diseases of the Dog. By J. W. Hill. Fifth edition. Illustrated. 1900.

WILLIAMS AND NORGATE, Henrietta-street, Covent-garden, London.
Medical Indoor Gymnastics, or a System of Hygienic Exercises for Home Use. By D. G. M. Schreber, M.D., Leipzig. Revised by R. Graefe, M.D. Translated from the 26th German edition by H. A. Day. Illustrated. 1899. Price 3s. net.

WREDEN, F., Braunschweig.
Die Krankheiten der Frauen, dargestellt von Dr. H. Fritsch. 1900.

WRIGHT, J., AND SON, Bristol.
The Medical Annual and Practitioners' Index. 1900. Eighteenth year. Price 7s. 6d net.

The Law of Wills for Testators, or How to make a Will. By G. F. Emery, LL.M. (Effingham Wilson, London), 1900; price 1s. 6d. net.—The Law affecting Trustees in Bankruptcy. By L. Duckworth. (Effingham Wilson, London), 1900; price 1s. net.—The Preservation of Health and the Hygiene of the Home. By J. E. Squire, M.D. Lond., D.P.H. Camb. (The Sanitary Publishing Company, Fetter-lane, London); price 3d.—Bishop's Travellers' Telegraph Code. (Effingham Wilson, Royal Exchange, London); price 1s.—Magazines, &c., for March: Strand Magazine, Boy's Own Paper, Girl's Own Paper, Leisure Hour, Sunday at Home, Ludgate Magazine, Westminster Review, Contemporary Review, Friendly Greetings, Myra's Journal, Pall Mall Magazine, Windsor Magazine, English Illustrated Magazine, Knowledge, Humanitarian, Wide World Magazine, New Century Review.

Appointments.

Successful applicants for Vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward it to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, for publication in the next number.*

ADAMS, J., M.B., C.M. Edin., has been re-appointed Medical Officer by the Runcorn Rural District Council.

ADAMS, J. D., M.D. St. And., M.R.C.S., has been re-appointed Medical Officer by the Langport Rural District Council.

ADENEY, E. L., M.D., M.R.C.S., has been appointed Physician to the General Hospital, Tunbridge Wells.

ALDERSON, WILFRED E., M.D., M.S. Durh., has been appointed Honorary Assistant Surgeon, Fleming Memorial Hospital for Children, Newcastle-on-Tyne, vice R. F. Craggs.

ANDERSON, A. J., M.B., C.M. Edin., has been appointed Medical Officer for the Ashford Sanitary District of the Staines Union, vice F. C. Tothill resigned.

BAXTER, S. E., L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer for the Wollaston Sanitary District of the Wellingborough Union, vice J. W. Orr, deceased.

BERRY, FREDERICK CHARLES, B.A., M.D., B.Ch. Dub., has been re-appointed Medical Officer of Health for Burnham (Somerset).

BONE, B. M., M.B., C.M. Edin., has been re-appointed Medical Officer of Health by the Towyn District Council.

BOYD, JOHN J., M.B., Ch.M. Glasg., D.P.H. Cantab., has been appointed Assistant Medical Officer of Health for the Borough and Port of Southampton.

BREWER, D., L.R.C.P. Lond., M.R.C.S., has been appointed Second Assistant Medical Officer for the Workhouse and Infirmary of the Parish of St. Mary Abbots, Kensington.

BROOK, W. H. B., M.D. Lond., F.R.C.S. Eng., has been appointed Coroner for the Lincoln North District.

BRUZAUD, ALFRED S., M.R.C.S., L.R.C.P. Lond., has been appointed Senior Assistant House Surgeon to the Huddersfield Infirmary.

BUCKLEY, JOHN, L.S.A., has been appointed Medical Officer for the Hasland Sanitary District of the Chesterfield Union, vice R. H. Hamilton, resigned.

AHILL, M., L.R.C.P., L.R.C.S. Edin., L.F.P.S. Glasg., has been appointed Medical Officer for the Whitby Sanitary District of the Wirral Union, vice H. A. Bredin, deceased.

CAMERON, H. C., M.D. Glasg., has been appointed to the Chair of Clinical Surgery in the University of Glasgow.

CHAPPLE, R. L., M.R.C.S., L.R.C.P., L.S.A., has been appointed Medical Officer for the Stairfoot District by the Barnsley Board of Guardians.

CLOWES, ERNEST FRANCIS, L.R.C.P. Lond., M.R.C.S., has been appointed Deputy Medical Officer for the Charfield District of the Thornbury Union.

COOPER, C. E., M.B., B.C. Cantab., has been appointed Medical Officer of Health for the Ivybridge Urban District, vice J. M. Randle, resigned.

EDDOWES, ALFRED, M.D. Edin., M.R.C.P. Lond., has been appointed Physician for Diseases of the Skin to St. George's and St. James's Dispensary, King-street, Regent-street, London.

EDINGTON, GEORGE H., M.D., M.R.C.S., has been appointed Visiting Surgeon to the Glasgow Training Home for Nurses.

FORBES, NORMAN HAY, F.R.C.S. Edin., L.R.C.P. Lond., J.P., has been appointed Medical Officer for the South-Eastern District of the National Fire Brigades Union.

GOLDIE, W. H., M.D., C.M. Edin., has been appointed Registrar to the Chelsea Hospital for Women, Fulham-road, London, S.W.

HALLIDIE, A., M.B., F.R.C.S., has been appointed Ophthalmic Surgeon to the Hastings, St. Leonards, and East Sussex Hospital.

HAMILTON, DAVID LIVINGSTONE, L.R.C.P., F.R.C.S. Edin., L.F.P.S. Glasg., has been appointed Medical Officer for the Timsbury District by the Clutton Board of Guardians, vice Mr. Wood, resigned.

HARCOURT, J. C., L.R.C.P. Lond., M.R.C.S., has been appointed Assistant Medical Superintendent for the Infirmary of the City of London Union.

HILDYARD, R. L., M.R.C.S., has been re-appointed Medical Officer by the Langport Rural District Council.

HITCHINS, CHARLES VERNON, M.R.C.S., L.S.A., has been re-appointed Medical Officer of Health for the Weston-super-Mare Urban District.

HUDSON, E., M.R.C.S., L.R.C.P. Lond., has been appointed Clinical Assistant to the Chelsea Hospital for Women, Fulham-road, London, S.W.

JONES, RICHARD, M.D. Edin., D.P.H. Cantab., has been re-appointed Medical Officer of Health by the Blaenau Festiniog Council.

KERR, J. C., M.R.C.S., has been re-appointed Medical Officer by the Plomesgate Rural District Council.

LEGG, T. PERCY, M.B. Lond., F.R.C.S. Eng., has been appointed Senior Surgical Registrar and Surgical Tutor, King's College, Hospital, London.

MACNALTY, F. C., M.A., M.D., M.Ch., T.C.D., has been appointed Surgeon to the City of Winchester Police, vice T. D. Richards, resigned.

MANKNELL, A., M.B. Lond., L.R.C.P., M.R.C.S., has been appointed Medical Officer for the First (East Bradford) Sanitary District of the Bradford (Yorks) Union, vice H. W. White, resigned.

MASON, WILLIAM, L.R.C.P. & S. Edin., L.A.H. Dub., has been appointed Medical Officer of Health for St. Austell (Cornwall).

MUDGE, ZACHARY BELLING, M.R.C.S., L.R.C.P. Lond., has been re-appointed Medical Officer of Health for the Philiack (Cornwall) Urban District Council.

MUNDEN, CHARLES, M.R.C.S., has been re-appointed Medical Officer by the Langport Rural District Council.

MUSSEN, A. A., M.D., D.P.H., has been appointed Assistant Medical Officer of Health for the City of Liverpool, vice E. P. Manby, resigned.

NETTLE, WILLIAM, M.R.C.S., L.S.A. Lond., has been re-appointed Medical Officer of Health for Liskeard.

NOBBS, A., M.D., C.M. Edin., has been appointed Clinical Assistant to the Chelsea Hospital for Women, Fulham-road, London, S.W.

NOTT, H. W., L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer for the Eastham Sanitary District of the Wirral Union, vice H. A. Bredin, deceased.

PARDINGTON, G. L., M.D. Durh., L.R.C.P. Lond., M.R.C.S., has been appointed Physician to the General Hospital, Tunbridge Wells.

RIX, B., M.R.C.S., L.S.A., has been appointed Surgeon to the General Hospital, Tunbridge Wells.

SIMMONS, BENJAMIN, M.R.C.S., L.S.A., has been re-appointed Medical Officer for three years for the Charfield District of the Thornbury Union.

SPENCER, E. M., L.R.C.P., L.R.C.S. Edin., L.F.P.S. Glasg., has been appointed Medical Officer for the Ninth Sanitary District of the Totnes Union, vice T. Lakeman, deceased.

STEVENS, BERTRAM CROSSFIELD, M.B., B.S. Durh., M.R.C.S., L.R.C.P., L.S.A., has been appointed Senior House Surgeon to the Huddersfield Infirmary.

TARBET, P. R., L.R.C.P. Lond., M.R.C.S., has been appointed Senior Assistant Medical Officer for the Infirmary of the Parish of St. Pancras, vice T. S. Boden, resigned.

TAYLOR, J., M.D. Aberd., has been appointed Medical Officer to the General Post Office, Keith.

The Chief Inspector of Factories announces the following appointments of Certifying Surgeons under the Factory Acts:—BERNARD ROBINSON L.R.C.P. Lond., M.R.C.S., for the Civil Parishes of Croxden and Rocester in the Uttoxeter Rural District; J. M. JOHNSON, M.D., M.R.C.S., for Leek Urban District Leek Rural District, except the Civil Parishes of Norton-in-the-Moors and the Civil Parishes of Cheddleton and Consall in Cheadle Rural District; E. F. M. NEAVE, M.B., Ch.B. Edin., for the Civil Parishes of Guthrie Kirkden, Rescobie (south of the Caledonian Railway Line), Dunnichen (east of the road running through Dunnichen and Bowriefauld) and Kinnell, in the county of Forfar; and R. B. MAHON, M.D. Irel., F.R.C.S. Eng., for the Ballinrobe Dispensary District, County Mayo.

THOMAS, A. H., M.B., Ch.B. Edin., has been appointed Medical Officer for the Aldborough Sanitary District of the Great Ouseburn Union, vice J. Sedgwick, resigned.

THOMSON, H. CAMPBELL, M.D., M.R.C.P. Lond., has been appointed Assistant Physician to the Middlesex Hospital.

VALENTINE, W., L.R.C.P., L.R.C.S. Edin., has been appointed Medical Officer for the Fourth Sanitary District of the Warrington Union, vice J. W. Watkins, resigned.

YEARSLEY, MACLEOD, F.R.C.S., has been appointed Surgeon to the Royal Ear Hospital, Soho-square, London.

Vacancies.

For further Information regarding each vacancy reference should be made to the advertisement (see Index).

BIRMINGHAM GENERAL DISPENSARY.—Vacancy on the staff of Resident Surgeon, unmarried. Salary £150 per annum. £30 a year allowed for cab hire, and furnished rooms, fire, lights, and attendance.

BOOTLE BOROUGH HOSPITAL, Liverpool.—Junior Resident Medical Officer. Salary £50, with board, lodging, and washing.

BOROUGH OF CREWE.—Medical Officer of Health. Commencing salary £300 per annum. Applications to the Town Clerk, Municipal Offices, Crewe.

CANNING-TOWN MEDICAL MISSION DISPENSARY, 520, Barking-road, London.—Assistant Medical Officer (qualified woman). Board and lodging provided.

CARDIFF INFIRMARY.—Assistant House Physician for six months. Salary at the rate of £50 per annum, with board, washing, and apartments. Also Resident Medical Officer for three years. Salary £100 per annum, with board, washing, and furnished apartments.

CHELSEA HOSPITAL FOR WOMEN, Fulham-road, S.W.—Clinical Assistant. Tenable for three months on payment of 8 guineas.

CLAYTON HOSPITAL AND WAKEFIELD GENERAL DISPENSARY, Wakefield.—Junior House Surgeon, unmarried. Salary £80 per annum, with board, lodging, and washing.

CUMBERLAND AND WESTMORLAND ASYLUM, Garlands, Carlisle.—Junior Assistant Medical Officer, unmarried. Salary £100 a year, with board and residence.

EAST SUSSEX COUNTY COUNCIL.—Consulting Medical Officer for one year. Honorarium 100 guineas, and travelling expenses.

GLASGOW DISTRICT ASYLUM AND MENTAL HOSPITAL, Gartloch.—Medical Officer (Junior Assistant or Locum Tenens). Remuneration as may be arranged. Apply to the Clerk, Glasgow District Lunacy Board, 38, Cochrane-street, Glasgow.

GOVAN DISTRICT ASYLUM, Crookston, near Paisley, N.B.—Junior Assistant Medical Officer. Salary £120 a year, with rooms, board, laundry, and attendance.

HARRIS PARISH COUNCIL, FOR THE SOUTHERN DIVISION OF HARRIS.—Medical Officer. Salary £90. Apply to Mr. Thomas Wilson, Solicitor, Lochmaddy, Clerk.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—Resident House Physicians for six months. Honorarium £25.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, Bloomsbury, London.—House Physician for six months, unmarried. Salary £20, with board and residence in the hospital.

HULL ROYAL INFIRMARY.—Honorary Assistant Surgeon for five years.

HULME DISPENSARY, Dale-street, Stretford-road, Manchester.—House Surgeon. Salary £150 per annum, with apartments, attendance, coal, and gas.

ITALIAN HOSPITAL, Queen's-square, London, W.C.—House Surgeon. Salary £50 per annum, with board, residence, and laundry.

LEEDS PUBLIC DISPENSARY.—Junior Resident Medical Officer. Salary £85 per annum.

LINCOLN HOSPITAL FOR THE INSANE.—Assistant Medical Officer. Salary £100.

LIVERPOOL INFIRMARY FOR CHILDREN, Myrtle-street.—House Surgeon. Salary £85 per annum, with board and lodging. Also Assistant House Surgeon for six months. Salary £25 for that period, with board and lodging.

LIVERPOOL STANLEY HOSPITAL.—Senior House Surgeon. Salary £80, with board, residence, and washing.

LONDON COUNTY ASYLUM, Horton.—Medical Superintendent, Horton Asylum, Epsom, now in course of erection. Salary £1000 per annum, with unfurnished house, rates, taxes, and water-supply free. Applications to the Clerk of the Asylums Committee, Office, 6, Waterloo-place, London, S.W.

METROPOLITAN ASYLUMS BOARD.—Four Assistant Medical Officers at the Fever and Small-pox Hospitals, unmarried. Salary £160 per annum the first year, and conditionally £180 the second, and £200 the third and subsequent years, with board, lodging, attendance, and washing, subject to statutory deductions. Applications to the Offices of the Board, corner of Carmelite-street, Embankment, E.C.

NEW ZEALAND PUBLIC LUNATIC ASYLUMS.—Two Assistant Medical Officers, unmarried. Salary £250, with board, lodging, and washing. Apply to the Agent-General for New Zealand, 13, Victoria-street, London, S.W.

NORTH RIDING INFIRMARY, Middlesborough-on-Tees.—Assistant House Surgeon. Salary £75 a year, with lodging, board, and washing. No beer allowed.

PADDINGTON GREEN CHILDREN'S HOSPITAL, London.—House Physician and House Surgeon for six months. Salary at the rate of 50 guineas a year, with board and residence.

PADDINGTON INFIRMARY.—Resident Clinical Assistant and Second Assistant to the Medical Superintendent for six months. Board, residence, and washing provided, and an honorarium at the rate of £50 per annum, conditionally. Personal application to Dr. M. F. Squire at the Infirmary, 235, Harrow-road, W.

PARISH OF RONSAY AND EGILSHAY, Orkney.—Resident Medical Officer (male or female). Salary £51 sterling per annum. Apply to the Clerk of Parish Council, Ronsay, Orkney.

PECKHAM HOUSE ASYLUM, Peckham.—Junior Assistant Medical Officer. Salary £120 per annum, with board and lodging.

POPLAR HOSPITAL FOR ACCIDENTS, Poplar.—Assistant House Surgeon for six months. Salary at the rate of £65 per annum, with board and residence.

PRESTON ROYAL INFIRMARY.—Senior House Surgeon. Salary £100 per annum, with board, lodging, and washing.

RAMSGATE AND ST. LAWRENCE ROYAL DISPENSARY, and the GENERAL HOSPITAL AND SEAMEN'S INFIRMARY.—Resident Medical Officer, unmarried. Salary £100 per annum, with furnished apartments, board, and attendance. £10 allowed for substitute during annual holiday.

ROYAL FREE HOSPITAL, Gray's Inn-road, London.—Senior Resident Medical Officer for 12 months. Salary £100, with board, residence, and washing.

ROYAL HALIFAX INFIRMARY.—Third House Surgeon, unmarried. Salary £50 per annum, with residence, board, and washing.

ROYAL SEA-BATHING HOSPITAL, Margate.—Assistant Resident Surgeon. Salary £52 per annum, with board and residence. Apply to the Secretary, Royal Sea-bathing Hospital Offices, 30, Charing-cross, London.

ROYAL SURREY COUNTY HOSPITAL, Guildford.—Assistant House Surgeon. Salary £30 a year, with board, residence, and laundry.

ST. MARY'S CHILDREN'S HOSPITAL, Plaistow, E.—Ophthalmic Surgeon to Out-patient Department. Also Assistant Resident Medical Officer for six months, unmarried. Salary at the rate of £60 per annum, with board, residence, laundry, &c.

SEAMEN'S HOSPITAL SOCIETY (*Dreadnought*), Greenwich, S.E.—House Physician for *Dreadnought* Hospital, Greenwich. Salary £75 per annum, with board and residence.

STAFFORDSHIRE GENERAL INFIRMARY, Stafford.—House Surgeon for two years. Salary £100 per annum, with board, lodging, and washing.

STAMFORD, RUTLAND, AND GENERAL INFIRMARY, Stamford.—House Surgeon, for two years, unmarried. Salary £100 per annum, with board, lodging, and washing.

STOCKPORT INFIRMARY.—Assistant House and Visiting Surgeon. Salary £70 per annum, with board, washing, and residence.

TEIGNMOUTH HOSPITAL, South Devon.—House Surgeon. Salary £50 a year, with board, lodging, and washing. £6 per annum allowed in lieu of stimulants.

WEST BROMWICH DISTRICT HOSPITAL.—Resident Assistant House Surgeon.—Salary £50 per annum, with board, &c.

WESTON-SUPER-MARE HOSPITAL.—House Surgeon, unmarried. Salary £80 per annum with board and residence in the hospital.

WOLVERHAMPTON AND STAFFORDSHIRE GENERAL HOSPITAL, Wolverhampton.—Assistant House Physician for six months. Honorarium at the rate of £50 per annum, and board, lodging, and washing provided.

WORCESTER GENERAL INFIRMARY.—Assistant House Surgeon and Dispenser for two years, unmarried. Salary £70 per annum, with board, residence, and washing.

Births, Marriages, and Deaths.

BIRTHS.

ABBOTT.—On March 3rd, at Hornsey-road, the wife of Charles Abbott, L.R.C.P. and S., of a daughter.

ADAMS.—On March 19th, at Uxbridge House, Uxbridge, Middlesex, the wife of Frank Adams, surgeon, of a daughter.

COX-MOORE.—On March 13th, the wife of Edward W. Cox-Moore, L.D.S., Bloomsbury-square, W.C., of a daughter.

DEVANE.—On March 14th, at Ashville, Maple-road, Anerley, the wife of Thomas F. Devane, L.R.C.P. Ed., L.R.C.S. Ed., of a daughter.

FREEMAN.—On March 18th, at Windermere-villas, Earlsfield, S.W., the wife of C. D. Freeman, M.R.C.S., L.R.C.P., L.S.A. Lond., of a daughter.

HANCOCK.—On March 14th, at Grove House, Belsize-grove, Hampstead, the wife of William Ilbert Hancock, F.R.C.S., of a daughter.

ISAACS.—On March 16th, at Sinclair-road, Kensington, the wife of E. Percival Isaacs, L.R.C.P., M.R.C.S., of a daughter.

LUCE.—On March 15th, at Friargate, Derby, the wife of R. H. Luce, M.B., of a son.

THORNE.—On March 18th, at The Glen, Dore, near Sheffield, the wife of Charles A. Thorne, L.R.C.P., L.R.C.S., of a son.

TYSON.—On March 15th, at Folkestone, the wife of W. J. Tyson, M.D., of a daughter.

MARRIAGES.

FINCH—BARRETT.—On March 14th, at St. John Baptist's, Kensington, Ernest J. Finch, Surgeon R.N., H.M.S. *Hussar*, to Dorothy, third daughter of Alfred E. Barrett, Holland Park-avenue, W., and Grimston, Norfolk.

SMITH—HUME.—On March 14th, at Sydney, New South Wales, Alfred Alexander Smith, M.R.C.S., of Clare, South Australia, to Eleanor Constance, youngest daughter of the late Colonel John Gwennap Hume, B.N.I. (By cable.)

DEATHS.

CORY.—On March 19th, Robert Cory, M.A., M.D. Cantab., F.R.C.P. Lond., of Lambeth Palace-road, St. Thomas's Hospital.

FOULDS.—On March 12th, Henry John Foulds, M.R.C.S. Eng., at Derby.

GRIGG.—On March 12th, at Wynberg Hospital, South Africa, William Chapman Grigg, M.D., of Curzon-street.

JAMES.—On March 8th, at 58, Netherwood-road, W., Richard James, L.R.C.P. Edin., M.R.C.S., L.S.A. (formerly of Notting-hill), aged 69 years.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

"TROUSSEAU'S WINE."

To the Editors of THE LANCET.

SIRS,—In THE LANCET of March 17th there is a request by one of your correspondents for the formula of Trousseau's wine. The formula is to be found in "Clinique Médicale de l'Hôtel-Dieu de Paris," par A. Trousseau, vol. ii., p. 37, published by J. B. Baillière et Fils, 1877. The following is the quotation: "De tous les remèdes hydragogues que j'ai employés dans ma vie, le plus puissant, suivant moi, est un vin dont j'ai imaginé la composition, et qui est connu sous le nom de vin diurétique de l'Hôtel-Dieu. En voici la formule: Vin blanc, 750 grammes; baies de genièvre, 50 grammes; scille, 5 grammes; digitale, 10 grammes. Faites macérer quatre jours. Ajoutez: acetate de potasse 15 grammes. Filtrez. 'Ce vin, que j'emploie depuis un grand nombre d'années et dont mes collègues ont accepti la formule, est en général facilement supporté; je lui dois dans ma pratique et à l'hôpital la guérison apparente des accidents des malad du cœur dans un grand nombre de cas où il semblait qu'il n'y eut rien à espérer.'"

I have pleasure to forward you the above extract, hoping it may be satisfactory to your correspondent.

I am, Sirs, yours faithfully,
Ulverstone, March 19th, 1900. JOHN ANDERSON, M.D. St. And.

To the Editors of THE LANCET.

SIRS,—Your correspondent in THE LANCET of March 17th, "A Subscriber," will find the formula for "Trousseau's wine" in the Codex Français, 1884, fol. 623, its official title being "Vin de Digitale composé de l'Hôtel-Dieu." We transcribe the formula in case you have space to quote it in full: Fol. digitalis pulv., 5 grammes; rad. scillæ, 15 grammes; bacc. juniperi, 75 grammes; potass. acetatis sicc., 50 grammes; vin blanc, 900 grammes; alcohol 90 per cent., 100 grammes. Bruise the squill and the juniper berries and macerate together with the digitalis in the mixed vin blanc and alcohol for six days, straining from time to time. Strain and press the mass. Dissolve the acetate of potash in the wine and filter. No official dose is quoted, but the usual dose is a tablespoonful twice or three times a day. The formula quoted differs somewhat from the original formula of Trousseau, which contained 6·60 grammes of squill and 13·20 grammes digitalis per litre.

We are, Sirs, yours faithfully,
New Bond-street, March 17th, 1900. ROBERTS AND CO.

To the Editors of THE LANCET.

SIRS,—The composition of this wine is as follows: Powdered juniper berries, 10 drachms; powdered digitalis, two drachms; powdered squill one drachm; sherry wine, one pint. Macerate for four days and add potassium acetate, three drachms. Press and filter. Dose, one tablespoonful three times a day for an adult.

I am, Sirs, yours faithfully,
March 19th, 1900. M.D.

*** It will be seen that all our correspondents do not agree in their formulæ.—ED. L.

FRIENDLY SOCIETY CLUB FEES.

To the Editors of THE LANCET.

SIRS,—Will anyone enlighten me as to the fees usually paid by the Foresters, Oddfellows, Rechabite, and philanthropic clubs per man per year?

I am, Sirs, yours faithfully,
March 19th, 1900. L.R.C.P., M.R.C.S.

WANTED A HOME.

To the Editors of THE LANCET.

SIRS,—I shall be obliged if you or any of your readers can advise me as to any charitable institution in Bath or Buxton where a child suffering from hereditary gout would be received for treatment. The following are the symptoms: chorea with disorderly movements of the limbs, convulsive ties, echolalia alternating with gouty toe, and cardiac distress. All the choreic symptoms disappear when the gout shows itself. The patient is a little girl, aged 12 years, bright, intelligent, industrious, and the case is a thoroughly deserving one.

I am, Sirs, yours faithfully,
March 13th, 1900. E. W.

ROYAL NAVY MEDICAL DEPARTMENT.

To the Editors of THE LANCET.

SIRS,—I have for years been puzzled to understand why the authorities at the Admiralty publish in the Navy List and also in the lists of candidates who have passed the examination for commissions in the medical department the letters M.B. after the name of any medical officer holding this degree. The authorities seem to think that any person holding this degree is far superior to others. The idea in publishing one degree and omitting the other is, I submit, unfair to the others and causes jealousy. I hold that the examinations for the

Licences of the conjoint licensing bodies in England, Ireland, and Scotland at the present time are far more searching and superior than any of the universities in the United Kingdom and the percentage of rejections is very much higher. My statement can be verified by a reference to the Minutes of the General Medical Council. The members of the General Medical Council occasionally visit the different examinations.

The following extracts may be of interest to the Admiralty. The visitors report on one university: "Our joint opinion is 'that the examination for the Degree of Bachelor of Medicine in the University of —— is inadequate for a degree admitting to the Medical Register and that the candidates were not sufficiently tested," &c. (see Minutes, General Medical Council, vol. xxiii., p. 344). The visitors report on another university: "We were much impressed with the insufficient knowledge of the essential subjects of the M.B. examination and the imperfect clinical training which a large portion of the candidates displayed" (see Minutes, General Medical Council, vol. xxiii., p. 392).

I am, Sirs, yours faithfully,

March 14th, 1900. JUSTICE.

CAVE.

THE *Teignmouth Post* of March 9th has the following advertisement:—

LADY MANAGER, or Lady and Gentleman, REQUIRED for Branch Office about to be opened by The British Viave Co. (Ld). Small investment necessary, but returnable at end of first year if contract cancelled by either party.—Address, FRANK RIDDING, Manager, British Viave Co., Ebrington House, Plymouth.

If the British Viave Co. is the same as the British Viavi Co. we advise ladies and gentlemen and everyone else to leave the institution severely alone. See THE LANCET, March 10th, 1900, page 742.

THE LOT OF THE PUBLIC VACCINATOR.

To the Editors of THE LANCET.

SIRS,—In the capacity of a public vaccinator I visited yesterday the home of a child six months old whose name appeared on my list. The day previous (March 12th) I had visited the house where the child was born—a distance of about eight miles from my surgery—but found that the parents had moved to the house I visited yesterday. When I arrived there the mother was out and had left the child in charge of her sister. There was also a neighbour in the house at the time. I informed them of the object of my visit and they saw no reason why I should wait until the mother's return, which was indefinite. I vaccinated the child accordingly, and after applying the necessary antiseptic pad the mother came in and began "blowing me up" and said that I had no legal right to do what I did. I took trouble to explain to her the circumstances, but to no purpose; she was adamant, and I left the house under heavy artillery fire. Kindly let me know your view of the case. I ought to say that she could not class herself a "conscientious objector."

I am, Sirs, yours faithfully,

March 14th, 1900. A PUBLIC VACCINATOR.

**** Our correspondent must obtain legal advice.—ED. L.

THE HYPODERMIC INJECTION OF ARSENIC.

C. H. would be grateful for information as to previous experiences, references to literature, and risks run as to hypodermic injections of arsenic, having regard to a case of severe leukæmia at present under his care. Into this patient have been injected hypodermically 5·33 grains of arsenious acid during 11 weeks inclusive of 14 days' interval, and 39⅓ grains (*sic*) of arseniate of soda during eight weeks inclusive of one week's interval, the whole course extending over 20 weeks. There are no signs of poisoning up to the present date, over a month since cessation of the treatment, and concurrent improvement of the blood during the injections.

"POPULAR MEDICINE."

To the Editors of THE LANCET.

SIRS,—Referring to your remarks in THE LANCET of March 10th on *Leach's Family Dressmaker* permit me to say that it is a perfectly erroneous statement that medical queries are either invited or answered in that journal; but were this the case we should but be adopting the methods of many other journals of a much higher class. The reply you quoted concerned the matter of a woman's personal appearance and not her health, and invidious as it may be to "apply to a popular paper" for advice it is well known that this is the only resource, as doctors are apt to "pooh-pooh" or smile good-naturedly over any such query. It appears to me monstrously unfair that you should single out an odd bit of advice from such a paper as our own and use it in the connexion that it was used in, while others who sin far more and who *do* give real medical advice should be unnoticed. I have nothing to do with the management of the advertisements and fully endorse what you say respecting them; but were there no other dressmaking journals to which you could have drawn attention?

I am, Sirs, yours faithfully,

M. CHRISTINE, Toilet Editress.

PS.—You must at least adjudge me honest, since I gave a simple remedy *before* suggesting the "half-crown bottle."

**** The statement which M. Christine calls "perfectly erroneous" was not made by us. The fact that other papers offend in a similar manner does not exonerate *Leach's Family Dressmaker* in respect of the matters to which we have called attention. If advertisements of abortifacient mixtures continue to be inserted in her paper it is open for Toilet Editress to resign her position. During a recent trial at Birmingham Mr. Justice Darling repeated his intention of sending to gaol, when opportunity served him, persons connected with the dissemination of these advertisements.—ED. L.

WHO IS RESPONSIBLE?

To the Editors of THE LANCET.

SIRS,—I should be glad to hear your opinion at your earliest convenience on the following point: A dentist (A) asks a medical practitioner (B) to come and give gas to a lady (C) who is having some teeth removed in order to have a new set. B is until this period *quite unacquainted with C who is A's patient.* As there are over a dozen stumps for removal B attends at A's house and gives gas on seven separate days. Nothing is said as to B's fee. A few weeks after B writes inquiring about the same. As no reply is received B writes a second letter to which also there is no reply. Two months have since elapsed and B has still heard nothing from A, who is still to his knowledge in the town. Who is really responsible for B's fees, the dentist or the patient? A is an L.D.S.

I am, Sirs, your faithfully,

March 19th, 1900. M.R.C.S.

**** In our view A is responsible for the fees, and he is certainly wanting in courtesy in sending no reply to B's letters. Is B certain that A received them? B must, of course, consult a solicitor before taking legal proceedings.—ED. L.

A STORY OF GEOGRAPHY.

THE *Daily Chronicle* publishes a good little story illustrating the bias that exists in the British mind towards the foreign spa and incidentally showing that a certain wealthy clubman is a poor geographer. The story is as follows:—

"A certain wealthy clubman was recently advised to try a course of baths at Droitwich. He had heard vaguely of the place and associating all forms of water-cure with the continent imagined that a town so named must be somewhere in Hungary or Poland. Having been in the habit of taking Paris as the base of operations in all his continental trips he took a ticket hither, put up at the Hôtel Bristol, and told the omniscient hotel clerk to work out the route to Droitwich. The clerk searched all the continental time-tables and guides to continental mineral cures in vain and had to admit that for once he was beaten. The Englishman, greatly annoyed, took a cab to Cook's Paris office, where he was informed that the route to Droitwich lay through London, whence it could be reached in about three hours."

ŒDEMA OF THE LOWER EXTREMITIES FOLLOWING INFLUENZA.

To the Editors of THE LANCET.

SIRS,—Can any of your readers inform me what is the best treatment for the dropsical swelling of the lower extremities which occasionally takes place after influenza? I am, Sirs, yours faithfully,

March 19th, 1900. M.D., &c.

AN ASPIRANT TO QUACKERY.

WE have received the following naive letter addressed to the "Editorial Dept.":—

DEAR SIR,—Do I require a License for making ointment to sell, and for making embrocation for sale, "ringworm," Cure, "Corn Cure" "Cure for cuts" Ect., or could I make and sell 'corn cure' only without the above, I think it would not be "patent. Medicine." any pacticlars on above will oblige. Yours

E. M.

We suppress E. M.'s address and full name, for we believe him to be only an unconscious offender, and are not certain that in writing to us he has desired publicity. The handwriting is in keeping with the literary style. Is it not extraordinary that a man not only without special training but without the ordinary rudiments of education should feel himself quite capable of treating the minor maladies of the public medically? E. M. would, we are certain, not dream of attempting to clean a watch without understanding its mechanism.

PRINCIPLES WHICH OUGHT TO CONTROL THE CONSTRUCTION OF MODERN ASYLUMS.

DR. R. H. STEEN of the West Sussex County Asylum publishes a paper briefly dealing with the above in the *Journal of Mental Science* (January, 1900). After a short historical review of the evolution of asylum architecture an account is given of modern asylum plans such as are embodied in the "pavilion" systems in vogue at the present day. This plan is to build the several blocks apart from one another and to make them each in a measure self-contained—i.e., each with its own dormitory, day-room, dining-room, bathroom, lavatories, store-rooms, &c. These blocks are connected by corridors and may be arranged in linear series or in H-shape, or on the echelon plan and its modifications. Examples and plans are given to elucidate the descriptions of existing asylums. The detached villa system—viz., small home-like buildings spread over a large estate—is illustrated by an account and plan of the celebrated Alt-Scherbitz Asylum near

Leipzig, built for 960 patients on an estate of 750 acres and which has become the prototype of other and similar institutions in Europe and America. Modern treatment demands that a hospital block furnished with the means and appliances for the most advanced medical and surgical procedure should be added to all large asylums. The best position for this is in the central block between the male and female sides, and the first floor should contain isolation rooms, sick attendants' room, and a small dormitory. The division of an asylum into two portions, acute and chronic, is, according to Dr. Steen, open to objection.

THE WOMB QUACK.

IN the *Lincolnshire Echo* of March 2nd appears an advertisement setting forth the talents of a certain Mrs. Slater. The advertisement is embellished with a portrait of a woman who, we take it, is the Mrs. Slater in question. We learn from the advertisement that she will attend Lincoln on March 3rd to afford an opportunity for ladies to consult her. "Her skill on all womb and internal complaints is well known throughout England. Every sufferer wearing an inward instrument ought to consult her. The most eminent operating surgeon alive said: 'If the use of inward instruments were persisted in they would have to build a hospital to treat the cancers and tumours created by them.'" We further learn that the Compress Belt for stout ladies is a great boon—first, it reduces measurement, and, secondly, it renders breathing easier. Further, it is worn by doctors' wives; it is worn by clergymen's wives; it is worn by hotel-keepers. We do not quite see that this proves the article to be so excellent for the same might be said of many other articles—e.g., boots. Mrs. Slater also gives special and careful attention to all spinal complaints. Special bandages are to be obtained for varicose veins and swellings in the legs and Mr. Slater attends for men. All advice is free. We suppose the advice given is to buy a belt, for we do not for one moment imagine that Mr. and Mrs. Slater are actuated by pure benevolence. The advertising "womb doctor" is always a pestilent person and does an incalculable amount of harm.

TO MEDICAL FREEMASONS.

To the Editors of THE LANCET.

SIRS,—Will you permit me through your columns to bring before the notice of medical Freemasons the cases of Herbert Eric Skrimshire and Gwendoline Hudson, No. 38 and No. 26 respectively on the lists of candidates for election to the Boys' and Girls' Schools in April?

I am, Sirs, yours faithfully,

Woking, March 20th, 1900. T. CAWLEY EAGER.

*** "A Medical Mason" also writes to ask for support for the secondidates who are, he states, the only children of medical Freemasons seeking election to the Masonic Schools on the present occasion.—ED. L.

LUNACY CERTIFICATES AND MEDICAL JUSTICES OF THE PEACE.

To the Editors of THE LANCET.

SIRS,—I shall be glad to have the opinion of your readers as to the action of C in the subjoined and like instances. A, B, C, and D are four practitioners in the same district and ostensibly the best of friends. C is also a Justice of the Peace. A is asked to visit an old patient who has become insane and, understanding that the friends desire the patient to go into a county asylum at a small weekly fee, he calls in B to examine and certify. A and B both issue certificates and an order for removal is signed by C. It is subsequently found that there is no county asylum in the county which takes in a paying patient. Accordingly, the relieving officer is called in who instructs C to judicially visit the patient who, in his turn, requests D to examine the case. C appears to have some special predilection for D and in all lunacy cases occurring in the district invariably seems to send D to examine, perfectly regardless of the professional attendant under whose charge the patient has been (on one occasion for 12 years in A's experience). 1. C may be within his legal rights, but is his action professionally friendly to either A or B and is it not likely to damage the prestige of both? 2. Is A correct in the feeling that the Commissioners of Lunacy prefer that certificates of lunacy should be issued (where only one is required) by the medical attendant who has had previous charge of the case and is therefore in a better position than any stranger to judge its merits?

I am, Sirs, yours faithfully,

March 20th, 1900. TWENTY YEARS' PRACTICE.

*** We can quite understand that A in the circumstances mentioned should feel a little disappointed at not being called in to certify in the case of his own patient, but there are several possible explanations of the course adopted by C. In the first place it is very usual for certain justices invariably, and as a matter of routine, to employ a certain medical man who knows the ordinary procedure for parish cases, that is to say, those which are removed to the county asylum. Although the guardians have no legal right to do so they sometimes stipulate for the employment of a certain medical man, and such stipulation has considerable moral, though no legal, binding on the justices. In point of fact, a contract not infrequently exists between the guardians and a certain medical man for the certification of such cases. Again, it is quite possible that C, although having the greatest respect for the opinions of A and B, might have wished for yet another and independent opinion on the state of the patient. In view, therefore, of all the circumstances of the case we cannot regard the action of C as being unfriendly either professionally or in any other respect, nor is it, in our opinion, likely to damage the prestige of either A or B. In answer to the second question the Commissioners of Lunacy have expressed no opinion upon the point and they invariably leave such matters entirely (as they must do in point of law) to the justice concerned in the case. It is he alone who is responsible for the legal procedure.—ED. L.

F. J. A. B.—We recommend the following list of books:—(1) "Hygiene and Public Health," Whitelegge (Cassell and Co., London); (2) Knight's "Annotated Model By-laws" (Knight and Co., London); (3) "Vital Statistics," Newsholme (Sonnenschein and Co., London); (4) "Manual of Bacteriology," Muir and Ritchie (Pentland, London and Edinburgh); (5) "Public Health Laboratory Work," Kenwood (Lewis, London). The above are essential; the following may also be consulted:—"Water supplies," Thresh (Rebman Publishing Company, London); "Micro-organisms in Water," Frankland (Longmans and Co., London); the chapter on Water Analysis in "Volumetric Analysis," Sutton (Churchill, London); "Purification of Sewage," Barwise (Crosby, Lockwood, and Co., London); "Law and Chemistry of Food and Drugs," Robinson and Cribb (Rebman Publishing Company); "Cattle Tuberculosis," Legge and Sessions (Baillière, Tindall, and Cox, London). We cannot decide which is the more difficult examination.

A Sufferer should consult his medical adviser. The condition is dependent upon many different causes. If it persists after treatment his medical adviser will probably suggest that he should see some other medical man in consultation. We cannot insert the letter.

Maque.—The question of midwifery nurses being of either sex has been raised before, but our correspondent may help the class to which he alludes by continuing to ask it. The address he inquires for is 12, Buckingham-street, Strand, London, W.C.

U.L.M.S.—We lay down no geographical limits, but the Fund is designed to meet emergencies.

L.S.A.—1. Yes. 2. About 14 years ago.

ERRATUM.—In the annotation in THE LANCET of March 17th, p. 787, upon the National Association for the Prevention of Consumption, the name of the seconder of the report was erroneously printed as Dr. L. H. Bryson. It should have been Dr. W. B. Ransom (Nottingham).

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, March 22nd, 1900.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rainfall.	Solar Radiation in Vacuo.	Maximum Temp in Shade.	Min. Temp	Wet Bulb	Dry Bulb	Remarks at 8.30 a.m.
Mar. 16	29·66	N. W.	0·13	68	48	39	39	40	Overcast
,, 17	29·47	N.	...	67	41	31	32	34	Cloudy
,, 18	29·60	N.E.	..	65	44	28	Fzn.	31	Fine
,, 19	29·21	S.W.	0·50	83	46	30	36	36	Overcast
,, 20	29·57	S.W.	0·03	92	54	36	40	41	Cloudy
,, 21	29·77	N.E.	...	78	58	34	37	38	Hazy
,, 22	29·47	E.	0·11	52	48	38	43	44	Overcast

During the week marked copies of the following newspapers have been received: *Birmingham Daily Post, Leek Times, Scotsman, Civil and Military Gazette (Lahore), South Wales Daily News, Chelsea Mail, Dundee Advertiser, Gainsborough Leader, Bradford Observer, Sheffield Daily Telegraph, Birkenhead News, Times of India, Pioneer Mail, Citizen, Isle of Man Times, Westminster Gazette, Leicester Daily Post, Englishman (Calcutta), Liverpool Daily Post, Bromley Chronicle, Manchester Guardian, Newcastle Daily Chronicle, Architect, Builder, Bristol Mercury, Glasgow Herald, Yorkshire Post, Gazette (Middlesbrough), Hereford Times, Man and Empire (Toronto), Record (Chicago), Lancashire Weekly Post, Pontefract Weekly Herald, Surrey Times, Brighton Gazette, Leeds Mercury, Cheltenham Examiner, Sanitary Record, Staffordshire Sentinel, Local Government Chronicle, Hertfordshire Mercury, Public Health Engineer, Natal Advertiser, Mining Journal, Reading Mercury, City Press, Loughborough Examiner, Surrey Advertiser, Local Government Journal, Guy's Hospital Gazette, Perthshire Advertiser, North Middlesex Chronicle, Straits Budget, Malvern Advertiser, Norfolk Weekly Standard, Topical Times, Daily Messenger (Paris), &c., &c.*

Medical Diary for the ensuing Week.

OPERATIONS.

METROPOLITAN HOSPITALS.

MONDAY (26th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), St. George's (2 P.M.), St. Mary's (2.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), Chelsea (2 P.M.), Samaritan (Gynæcological, by Physicians, 2 P.M.), Soho-square (2 P.M.), Royal Orthopædic (2 P.M.), City Orthopædic (4 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (2 P.M. .

TUESDAY (27th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), Guy's (1.30 P.M.), St. Thomas's (3.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), West London (2.30 P.M.), University College (2 P.M.), St. George's (1 P.M.), St. Mary's (1 P.M.), St. Mark's (2.30 P.M.), Cancer (2 P.M.), Metropolitan (2.30 P.M.), London Throat 2 P.M. and 6 P.M.), Royal Ear (3 P.M.).

WEDNESDAY (28th).—St. Bartholomew's (1.30 P.M.), University College (2 P.M.), Royal Free (2 P.M.), Middlesex (1.30 P.M.), Charing-cross (3 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), King's College (2 P.M.), St. George's (Ophthalmic 1 P.M.), St. Mary's (2 P.M.), National Orthopædic (10 A.M.), St. Peter's (2 P.M.), Samaritan (2.30 P.M.), Gt. Ormond-street (9.30 A.M.), Gt. Northern Central (2.30 P.M.), Westminster (2 P.M.), Metropolitan (2.30 P.M.), London Throat (2 P.M.) Cancer (2 P.M.)

THURSDAY (29th).—St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.) University College (2 P.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), London (2 P.M.), King's College (2 P.M.), Middlesex (1.30 P.M.), St. Mary's (2.30 P.M.), Soho-square (2 P.M.), North-West London (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (Gynæcological, 2.30 P.M.), Metropolitan (2.30 P.M.), London Throat (2 P.M.), St. Mark's (2 P.M.).

FRIDAY (30th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), King's College (2 P.M.), St. Mary's (2 P.M., Ophthalmic 10 A.M.), Cancer (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (2 P.M. and 6 P.M.).

SATURDAY (31st).—Royal Free (9 A.M. and 2 P.M.), Middlesex (1.30 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), University College (9.15 A.M.), Charing-cross (2 P.M.), St. George's (1 P.M.), St. Mary's (10 P.M.), London Throat (2 P.M.).

At the Royal Eye Hospital (2 P.M.), the Royal London Ophthalmic (10 A.M.), the Royal Westminster Ophthalmic (1.30 P.M.), and the Central London Ophthalmic Hospitals operations are performed daily.

SOCIETIES.

MONDAY (26th).—MEDICAL SOCIETY OF LONDON.—8.30 P.M. Dr. Luff: The Gelatinous Form of Sodium Biurate and its bearing on the Treatment of Gout.—Dr. Bain: The Action of Various Drugs and Diets on the Excretion of Nitrogen in Gout.

TUESDAY (27th).—CHILDHOOD SOCIETY (Library of the Sanitary Institute, 72, Margaret-street, W.).—8 P.M. Mr. S. H. Wells: Science Teaching.

ROYAL MEDICAL AND CHIRURGICAL SOCIETY (20, Hanover-square, W.).—Dr. Bowles and Mr. G. R. Turner: A Case of Rupture of the Œsophagus caused by Vomiting.—Mr. A. Pearce Gould: A Case of Sarcomatous Tumour of the Gastro-Hepatic Omentum removed by Operation, with Remarks on the Diagnosis of such Tumours.

WEDNESDAY (28th).—DERMATOLOGICAL SOCIETY OF GREAT BRITAIN AND IRELAND (20, Hanover-square, W.).—4.30 P.M. Informal Exhibition of Cases. 5 P.M. Ordinary Meeting.

HUNTERIAN SOCIETY (London Institution, Finsbury-circus).—8.30 P.M. The President: Address. Paper:—Dr. D. Ross: Some Points in the Therapeutics of Gout.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

MONDAY (26th).—MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M. Dr. A. Whitfield: Consultation. (Skin.)

TUESDAY (27th).—ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 P.M. Dr. P. Horton-Smith: The Typhoid Bacillus and Typhoid Fever. (Goulstonian Lecture.)

ROYAL INSTITUTION OF GREAT BRITAIN.—3 P.M. Prof. E. Ray Lankester: The Structure and Classification of Fishes.

MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M. Dr. W. Miller Ord: Consultation. (Medical.)

WEDNESDAY (28th).—MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—5 P.M. Mr. J. Hutchinson: Clinical Lecture:—The Present-day Treatment of Syphilis. 6 P.M. Annual Meeting.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST (Brompton).—4 P.M. Dr. Acland: Cases illustrating various Types of Pulmonary Tuberculosis.

THE HOSPITAL FOR SICK CHILDREN (Gt. Ormond-street, W.C.).—4 P.M. Mr. Pitts: Demonstration of Selected Cases.

THURSDAY (29th).—ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 P.M. Dr. W. B. Cheadle: Some Cirrhoses of the Liver. (Lumleian Lecture.)

MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M. Mr. J. Hutchinson: Consultation. (Surgical.)

FRIDAY (30th).—MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M. Mr. T. Collins: Consultation. (Eye, Ear, Nose and Throat.) 5–7 P.M. Mr. J. Griffith: Class. Practical Ophthalmology. Demonstration IV.

ROYAL INSTITUTION OF GREAT BRITAIN.—9 P.M. Prof. J. A. Thomson: Facts of Inheritance.

EDITORIAL NOTICES.

It is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITORS," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this Office.

Lectures, original articles, and reports should be written on one side of the paper only, AND WHEN ACCOMPANIED BY BLOCKS IT IS REQUESTED THAT THE NAME OF THE AUTHOR, AND IF POSSIBLE, OF THE ARTICLE, SHOULD BE WRITTEN ON THE BLOCKS TO FACILITATE IDENTIFICATION.

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers, not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET *should be addressed "To the Manager."*

We cannot undertake to return MSS. not used.

MANAGER'S NOTICES.

THE INDEX TO THE LANCET.

THE Index to Vol. II. of 1899, which was completed with the issue of Dec. 30th, and the Title-page to the Volume, were given in THE LANCET of Jan. 6th.

VOLUMES AND CASES.

VOLUMES for the second half of the year 1899 are now ready. Bound in cloth, gilt lettered, price 18*s.*, carriage extra.

Cases for binding the half-year's numbers are also ready. Cloth, gilt lettered, price 2*s.*, by post 2*s.* 3*d.*

To be obtained on application to the Manager, accompanied by remittance.

TO SUBSCRIBERS.

WILL Subscribers please note that only those subscriptions which are sent direct to the Proprietors of THE LANCET at their Offices, 423, Strand, W.C., are dealt with by them? Subscriptions paid to London or to local newsagents (with none of whom have the Proprietors any connexion whatever) do not reach THE LANCET Offices, and consequently inquiries concerning missing copies, &c., should be sent to the Agent to whom the subscription is paid, and *not* to THE LANCET Offices.

Subscribers, by sending their subscriptions direct to THE LANCET Offices, will ensure regularity in the despatch of their Journals and an earlier delivery than the majority of Agents are able to effect.

The rates of subscriptions, post free, either from THE LANCET Offices or from Agents, are:—

FOR THE UNITED KINGDOM.		TO THE COLONIES AND ABROAD.	
One Year	£1 12 6	One Year	£1 14 8
Six Months	0 16 3	Six Months	0 17 4
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Subscriptions (which may commence at any time) are payable in advance.

SUBSCRIBERS ABROAD ARE PARTICULARLY REQUESTED TO NOTE THE RATES OF SUBSCRIPTIONS GIVEN ABOVE. It has come to the knowledge of the Manager that in some cases higher rates are being charged, on the plea that the heavy weight of THE LANCET necessitates additional postage above the ordinary rate allowed for in the terms of subscriptions. Any demand for increased rates, on this or on any other ground, should be resisted. The Proprietors of THE LANCET have for many years paid, and continue to pay, the whole of the heavy cost of postage on overweight foreign issues; and agents are authorised to collect, and do so collect, from the Proprietors the cost of such extra postage.

The Manager will be pleased to forward copies direct from the Offices to places abroad at the above rates, whatever be the weight of any of the copies so supplied. Address—THE MANAGER, THE LANCET OFFICES, 423, STRAND, LONDON, ENGLAND.

Communications, Letters, &c., have been received from—

A.—Ashwood House, Kingswinford, Medical Superintendent of; Messrs. Allen and Hanburys, Lond.; Messrs. Ayrton and Saunders, Liverpool; Anglo-Swiss Condensed Milk Co., Lond.

B.—Mr. C. A. G. Browne, Lond.; B. M. B.; T. B. Browne, Ltd., Lond.; Mr. A. Benthall, Lond.; Brin's Oxygen Co., Lond.; Mr. H. Browne, Lond.; Mr. Lennox Browne, Lond.; Mr. H. Borland, Glasgow; Mr E. C. Brodrick, Tavistock; Dr. V. Burrow, Tring; Mr. H. Brown, Leeds; Mr. L. A. Bidwell, Lond.; Bucklow Rural District, Medical Officer of Health of; Borough of Crewe, Medical Officer of Health of; Dr. Burton-Fanning, Norwich; Dr. H. M. W. Bridgman, San Remo.

C.—Dr. Alfred Cox, Gateshead; Childhood Society, Lond., Secretary of; Professor Corfield, Lond.; Chamfhandratintz; Benagaria; Cornwall County Council, Clerk of; Dr. A. Cordes, Geneva; Messrs. Cassell and Co., Lond.; Canning Town Medical Mission, Resident Medical Officer of; Mrs. Chapman, Lond.; Carnos, Ltd., Great Grimsby; Mrs. Cullen, Cheltenham; Clayton Hospital, Wakefield, Hon. Secretary of; Chelsea Hospital for Women, Secretary of; Dr. F. G. Clemow, Lond.

D.—Dr. D. Duncan, Chester-le-Street; Sir Dyce Duckworth, Lond.; Dr. C. R. Drysdale, Lond.; Dr. S. Delépine, Manchester; Mr. A. Duke, Cheltenham; Dental Hospital of London, Secretary of; Deutscher Inserenten-Verband, Cologne.

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